The Plough, the Loom, and the Anvil.

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PROGRESS OF PUBLIC OPINION AT THE SOUTH AND WEST.

FROM almost every portion of the South and West, and by almost every mail, we obtain evidence of the growing popularity of the doctrine that if the farmer and planter would grow rich, they must endeavor to induce the owners of looms and anvils to come and take their places by the sides of their ploughs and harrows. Men are everywhere learning to see that unless they consume on, or near the land the products of the land, their farms and plantations must be exhausted, and they must themselves become impoverished. Everywhere they are opening their eyes to the fact that they waste annually more labor than would build mills and furnaces by aid of which they could convert their food and their cotton, or wool, into cloth, or their food, their coal and their ore into iron. Everywhere they are opening their eyes to the fact that when cloth and iron can be paid for in potatoes, and turnips, and hay, and milk, and veal, and other things of which the earth yields largely, the product of rich lands, they are cheap, because obtained in return for little labor, whatever may be the nominal price; whereas when they must be paid for in wheat or cotton, of which the earth yields by bushels, or pounds, they are dear, because obtained in return for much labor. Everywhere they are awakening to the great fact that "population makes the food come from the rich soils," and that if they would cultivate such soils they must make a market for those commodities of which the earth yields by tons, and that are too bulky for transportation. Of the evidences of this gradual change in the state of public opinion that have come to our notice through the public press and our personal correspondence, there is none that has struck us more forcibly than that contained in the recent message of the Governor of Missouri; and we do not know that we can better occupy a few of our pages than in giving place to this able view of this great question.

THE ADVICE OF A WESTERN MAN TO WESTERN MEN,

And of one whose party predilections would lead him to the adoption of the doctrines of the Treasury Report—and therefore it is entitled to careful consideration.

"This subject of internal improvement is one of vast importance to our country; but the subject of establishing manufactories is another of equal importance; and although the two are in their nature very unlike each other, yet the encouragement of either would produce a similar effect upon the country; that is, improve the prices of the productions of the soil, and diminish the prices of manufactured articles. The operation of each is better illustrated by an example.

"From this place, 20,000 bushels of wheat and upwards—the growth of this year—has been or will be shipped. The average price of this wheat in this place, and probably for the whole length of the Missouri river, has been about fifty cents per bushel. In St. Louis, an average price for the same wheat has been about eighty cents. This is a difference of thirty cents; and twenty cents of this is probably for freight. The tax for freight, on the 20,000 bushels of wheat shipped from this place for this year, will then be $4,000. From every district of ten miles, including both sides of the Missouri river, we may safely calculate that an equal amount of wheat of the present crop will be shipped. This would make for the Missouri river, say 600,000 bushels, and the freight on this amount would be $120,000. Now, if the river was well improved, at least half

this amount paid for freight would be saved to the wheat grower, say in round numbers the sum of $60,000 in shipping the present year's crop; and the next is expected to be much larger. This sum, properly expended, would put the Missouri river in a very safe navigable condition. And this is but one article of export, nothing being said of the reduction of freights on the great number of imports. And what is here said of the Missouri river is applicable to the other rivers, and to railroads and canals, in proportion to the demand for transportation on them. This is the improvement side of the question.

"The great anxiety in our State to improve rivers and construct railroads is the result of a strong desire to open good ways for the conveyance of our raw material to the manufacturing districts of country, to be exchanged for their fabrics. If, instead of improving rivers, constructing railroads, and digging canals, the amount of money necessary to make these improvements was expended in erecting manufactories through the country, then, in a short time, a large amount, say one-half of our population, would be taken from the cultivation of wheat and employed in spinning wool and cotton, and hemp and flax, and in working up the iron, lead, copper, and other metals of the country, and in making glass, stone, and earthen ware, and the one thousand other articles demanded by the wants of the community. If half the people were taken from the wheat field, the growth of wheat would be diminished one half, and the demand for that product would be increased, and the price doubled; and with little or no charge for freight, because the factory should be in the neighborhood of the wheat grower. And in this state of affairs, while the farmer would be getting a higher price for his wheat, he would obtain his manufactured articles at lower prices. His wheat would bring him more, because he would sell it without paying freight; and he would buy his manufactured articles cheaper, because they would come free of similar charges.

"It seems, then, that the improvement of our rivers, the construction of railroads, digging canals, and the erection of manufactories, would each affect the prices of products in the same manner, but perhaps not in the same ratio. It is important, then, to inquire which course of policy should be encouraged first. About 12,000,000 of dollars are invested in the Lowell factories. These would probably make double as many fabrics as our State would consume, and it might take twice the above sum to improve our rivers, and construct the contemplated roads, and the necessary canals. It might, then, be well to give every possible encouragement to manufactories, as the first and most profitable step to be now taken. But the encouragement of these, as well as our agricultural pursuits, would soon demand the adoption of a system of internal improvements. Our surplus fabrics, as well as our surplus products, might soon demand other markets. But our first move should be to rear the factories.

"DIVISION OF PURSUITS.

"In a previous message, the necessity of diversifying our pursuits, with the view of enhancing the value of all labor, was earnestly urged. This matter may not strike the public mind so forcibly now as it might have done a few years back; because, for the present, many of the productions of the soil are in fair demand and produce comparatively good prices; but this was not the case a few years back, nor need we expect it to continue so for many years to come, unless we increase the variety of our pursuits and the demand for our products at home. The causes of the present increase in prices may be but temporary. One is the failure of crops in Europe. This may cease with the return of better seasons. The other is the repeal of the high tariff. This may be re-enacted before another year passes.

"These are, then, but temporary causes, and we need something more permanent to create a demand and enhance the prices of our products. This would be more certainly effected by a proper division of labor than by any other cause.

"At this time, wheat and corn, beef and pork, hemp and tobacco, are our staples: and to these we may add a few horses and mules. But nearly our whole population is engaged in agriculture, and almost every man raises as much wheat, corn, beef and pork, as his necessities require; and many as much as would supply a dozen families; and those who do not raise a supply are apt to be unthrifty farmers, with but little means of buying from others: and hence, there is frequently no demand, or else a very dull market for the surplus articles produced.

"It is plain to the senses of every one, that if by any accident or unusual occurrence—a bad season—a destructive hail-storm—a visit from noxious insects—or any other cause, only half crops are produced to feed our whole population, the demand would be greater and the price doubled. If one-half of our population should cease to work, the same result as to demand and prices would follow. The idleness of one-half of our population would operate on the other—the working half—as a famine in Europe does upon the people of our Union. The idleness and the famine would each increase the demand and enhance the value of food. But each of these causes would of necessity give but a tem

porary value. The idleness in our State, and the famine in Europe, if continued, would each be followed by an exhaustion of the means to purchase, and both classes would sink from the condition of purchasers to that of beggars. But if half of our population, instead of ceasing to work, should only cease to cultivate the soil, and should engage in some other equally profitable employment, then, the whole population, having still to be fed by the labor of one-half, the same increased demand for the products of the soil, and an equal or greater enhancement of prices would follow; and this increased demand and enhancement of prices, being based on a proper division of pursuits, the means of paying would always be certain, lasting, and increasing. And, this change of pursuits effected, the other half of our population might also expect better profits from their labor than they can now reap by cultivating the soil. If all this be true, then it becomes important to inquire how we shall divide our pursuits. If we can encourage manufactories, we shall accomplish this object to a great extent, and, probably, in no other way so successfully.

"But this matter can be better illustrated by examining the manner in which our present system of affairs actually operates. Say a number of our citizens want a quantity of domestic shirtings and sheetings. To get them, their first operation is to raise a quantity of wheat. This is shipped to the South and exchanged for cotton; and this cotton is shipped to Lowell, and there hands are employed to make it into sheetings and shirtings. These hands must be fed, and if the usual exchange of products which ought to exist in every country, be carried out in this transaction, then our citizens, at the time of sending their cotton to Lowell to be made into cloth, should also send a quantity of meal and flour, and pork, and beef, and butter, and lard, to feed the manufacturers, and to pay, in part, for the labor. The shirtings and sheetings completed, they are shipped back to our citizens, and delivered to them on the payment of the expense of shipping the cotton to Lowell, the expense of shipping food to the same place to feed the hands, the expense of shipping the fabrics back to our citizens, the value of the labor bestowed on the fabrics, and the profits of the owner of the factory. This is the best phase in which the operation of exchanging our products for those of the eastern manufactories can be placed, because in any other there are many intervening charges by other persons not mentioned here. Now it is evident that the shipping of the cotton to Lowell, the shipping of the provisions to feed the hands, and shipping the shirtings and sheetings back, are all expenses that might be saved by having this work done at home. And in addition, we could get hands cheaper here, and feed them cheaper than in Lowell, while performing the labor.

"But this matter can be made still more striking by another illustration, even more simple and plain in its nature than the preceding. For our wheat, in this part of our State, a fair average price we may say is fifty cents per bushel. For plain shirtings a fair price with us is ten cents per yard. At these rates a bushel of wheat will buy, in our market, five yards of such shirtings. This same wheat is worth in Boston, an average price of one dollar and twenty-five cents per bushel. The same shirtings in the Boston market are worth five cents per yard. Then the bushel of wheat there, would buy twenty-five, instead of only five yards of such shirtings, being a difference of twenty yards in the value of the bushel of wheat here and the value there. This twenty yards, then, in every twenty-five, is what we lose by shipping our cotton to Lowell, to have it manufactured for us, and our provisions to the same point to feed the manufacturers on, instead of employing and feeding hands to do the work at home. The example here given applies with equal force to other articles, and the only remedy for this evil, the only mode of saving this great loss, that can present itself to our minds, is to manufacture at home.

"MANUFACTORIES.

"If we manufacture at home, our heavy materials, our provisions, and the manufactures of hemp and tobacco, our horses and mules, would be shipped down stream to the South, and exchanged for cotton. This exchange would absorb a large portion of our surplus products of the soil. The cotton, a light article, might be brought up stream at proper seasons of the year for a very small cost. To manufacture it, would require a large portion of our population, and those having to be fed, would consume the balance of our surplus provisions; and thus the agricultural part of our population would be well provided for. With equal care, the manufacturing part should be encouraged; and they could not suffer, once fairly under headway, because we have all the means of manufacturing here cheap and abundant. We have good water-power, and plenty of fuel, and both are cheap and easily obtained. Real estate is abundant, at the lowest prices. Provisions are plenty, and, at double their present value, would be much cheaper than they are in places where manufactories have succeeded well. The fabrics produced, at half the prices many of them are now selling at in various parts of our State, would still be much higher than the same fabrics at Lowell. Our provisions then would cost the manufacturer less and his fabrics would sell for more than in other places: and still our

farmer would sell his provisions higher and buy his shirtings and sheetings and other articles lower than he now does.

"If these are facts, they are of deep interest to our population, and deserve to be well considered by your body.

"The encouragement of manufactories would also widen the field of agricultural pursuits. It would encourage wool-growing, to which business no country is better adapted than ours; and it would extend the hemp-growing business: and by manufacturing those articles, we should reap from them more than double the profit. It would encourage the growth of all our staples, to be exchanged for cotton, for the use of our factories, and all pursuits, and give new life and vigor to our population, and increase their wealth and comfort.

"If it be so essential to the interests of our country to encourage manufactories, then it becomes a matter of deep interest to the Legislature to ascertain the best mode of giving that encouragement.

"It is true that the two political parties into which our country has been divided, have differed as to the best mode of encouraging manufactories, one party being for a high tariff to protect them, while the other claimed that they had protection enough under a low tariff; but in these differences, it should always be remembered that whatever may be the party division as to the best mode of accomplishing the object, yet the simple fact of making these things—of manufacturing the necessaries or luxuries of life—is neither whig nor democratic policy, exclusively, any more than making corn, wheat, hemp, or tobacco: but making them is and ought to be the policy of the whole country—of every political party.

"But the question before us now is one in regard to the best manner of encouraging manufactories in our State. The effect and operation of a high tariff upon them was spoken of in my message to the last legislature, and then an effort was made to show that a high tariff would retard the establishment of manufactories in our State, and whether successfully or not, the position then assumed has not been controverted."

What was the argument of the Governor in his previous message, we do not know; but sure we are that if he had examined the question carefully, he would have arrived at a different conclusion. The natural place for the loom is by the side of the cotton and the food, and that for the furnace is by the side of the food and the ore; and there they would long since have been but for the existence of great disturbing causes, which it is the object of this journal to point out, and of the protective system to remedy, and *thus* bring about gradually that state of things which is predicted by the Secretary of the Treasury in his last report—perfect freedom of trade.

That officer tells us distinctly that "the belief is erroneous" that the manufacturers, if now protected by a tariff adequate to enable them to continue their operations in despite of the unceasing fluctuations abroad, and thus to place the loom and the anvil by the side of the plough, will continue to desire protection. He asserts distinctly that as "they increase in number, skill, capital, and products, they will cease to desire to perpetuate high tariffs." "When," he adds, "they attain this condition, and their fabrics exceed the home demand, they will desire free trade, to open to them the foreign markets. In England," as he further says, "this is now the case, and there manufacturers are the great advocates of free trade, as our manufacturers in time will be, and ultimately unite with all other classes in desiring the abandonment of all tariffs and custom-houses, and the repeal of all restrictions on commerce."

It is perfectly obvious from this admission of the Secretary, that the road to ultimate perfect freedom of trade lies through the adoption of a decidedly protective tariff—one that will enable men to adopt the course indicated by the Governor of Missouri, combining their efforts with a view to make the exertions of all more productive, and thus obtain by the labor of half a dozen hours a larger amount of food and clothing than they now obtain for that of a dozen. That they should be enabled to do so, it is indispensable that the nation adopt that policy which will tend to prevent the necessity for exhausting poor soils, and then flying from the neighborhood of rich ones, as

is now being done in every part of the Union, but most especially in Virginia and South Carolina. Men are everywhere running away from each other, every man seeking to roll his own log, although all see that two can roll a log that a thousand, each acting separately, could neither roll nor lift. On this subject of combination of action, the Ex-Governor appears to have very correct views. He tells the people of the State that

"The best plan is, in every section of our country where one is demanded by the wants of the community, for the people to combine their means, as they would in the construction of a railroad or any other improvement. To be profitable, a manufactory of almost any kind should be constructed on a large scale, and that would require a large capital—such an amount as would seldom be found in the possession of one man, and such an amount as it would not be desirable for one man to possess.

"If this be so, then factories ought to be established by companies or associations of persons. And this being so, it becomes important to ascertain the best mode of organizing and governing these companies or associations, so as to reap the advantages to result from a combination of their means, without subjecting ourselves to the injuries which such bodies often inflict upon a community."

His views in regard to the legislative action required to facilitate combination, are in some respects very sound, although in others not so much so. He is decidedly in favor of general laws for the purpose, thereby avoiding special legislation, and there he is very right; but he is doubtful about permitting associations without imposing upon the associates an amount of liability that would, in its effects, tend to prevent association. Very little reflection is needed to see that this is injudicious. He says that they should combine as they do for the making of railroads, and that they may do so, all that is needed is that they should be so permitted to combine. The makers of railroads are never hampered with responsibilities such as fetter persons who trade in money, or who make cloth, and the reason is, that the roadmaker is everywhere looked upon as a friend whose aid is to be invited, whereas the making of cotton or iron are too frequently regarded in a different light, and yet the latter are greater friends to the farmer than the former. The roadmaker enables the farmer *to go* to market. The cloth or iron maker *brings the market to his door*, and enables him to sell that portion of his labor that is not needed on his farm—that of his sons and daughters, and that of his wagon and horses—his timber, and many other things that could not be sold by aid of the best roads in the world.

It is full time that the planters and farmers of the South and West should acquire the habit of association, and that they may do so, it is essential that they should free themselves from all those restrictions on the exercise of the right of association that we have imported from abroad—from countries in which the few alone were permitted to associate for the formation of joint-stock companies, that they might monopolize the benefits that were to be derived from combination of action. Throughout Europe there is a tendency to the abolition of those restrictions. In England, so recently as the last century, no joint-stock company, with transferable shares, was lawful, even although all the parties were liable. Step by step, with growing civilization, we see a change, and the day is not far distant when it will come to be recognised both there and here, that all men have a right to associate for trading, or manufacturing, or roadmaking, or money-lending, on such terms as they may think proper to agree upon, provided only that *perfect publicity* be given to their proceedings, so that every man who trades with them may know *the terms on which they trade.*

In no part of the world do corporations so much abound as throughout New England, and therefore it is that the losses by corporations are there so small. There are there *no monopolies*. Men make banks when and where they please; and if they find there are too many, some of them wind up their

business: and they do so almost as unhesitatingly as in other States the shoemaker closes his shop and removes elsewhere, when it is found that shoemakers have become too numerous. The consequence of this is, that they have the best banking system, and the soundest currency in the world; and the sole reason therefor is that there *the trade in money is most free.*

What has been best said on the habit of association, and its advantages, may be found in Mr. Carey's work, "The Past, the Present, and the Future," page 229, which we will take an early opportunity to insert, for it is one of the subjects most necessary to be studied, and yet is it the one which is the least studied and understood by the *practical farmer.*

MR. WILDER'S AGRICULTURAL REMARKS.

Among the best signs of the times, is the institution of meetings of the members of the legislature, and others, at the seats of State Governments, during the sessions of Assembly, to discuss agricultural questions. These discussions will be quite appropriate, and no less useful, should they embrace the obligations of the general government to provide for agricultural, and civil, as well as for military instruction—and if, moreover, they should bring under consideration the obligation of that same government so to shape its policy as to bear beneficially on the interests of the plough—for without the products of the farmer, what would become of all the other more special interests for the care of which departments of government are created, and secretaries appointed, and immense sums of money expended in various forms?

In their meetings at Albany, the question has been started, how far they should sanction the recommendation of the Governor for a School of Agriculture; and as usual, instead of uniting first to demand that from the government, they are likely to be diverted from the main object, by disputes about details. Let each State, we should say, first compel Congress to reduce the appropriations for the army and the navy, and give the amount for agricultural education in each State. Why dispute, on a question like this, about how much chemistry has done for agriculture?

Let them take up the course of instruction at West Point, only substituting the plough and the spade for the cannon and the sword, and leaving *all the rest as it is*, and we undertake to say that teachers so instructed, only applying chemistry and mechanical philosophy to the analysis and composition of plants and grasses, instead of rockets and gunpowder—to the structure of wagons and threshing-machines, instead of gun-carriages,—yes, we undertake to say that if the government will fill the country with teachers so instructed, they would add as much to the agricultural as they are now doing to the blood-shedding capabilities of the country; and that they would win more true glory for this Republic by preventing war, than is to be won by an unbroken series of the most brilliant victories won in fields of blood. But of what avail is one poor feeble voice like ours in the cause of humanity and truth?—when not a press, nor an agricultural society in the land, will unite in the demand, except that of Maryland?

Of the meetings referred to, after such men as Wilder and Teschemacher, and Gray, Walker, French, Brooks, Read, &c., become enlisted and prevailed on to "give in their experience," there ceases to be any occasion to dwell on their utility.

In a chance number of a Boston paper, we find the following. We say a chance number, because according to the wisdom of our rulers in Post-office matters, while the meanest hebdomadal in the land has the privilege of exchanging *freely* with every newspaper in it, of whatever size, no periodical is allowed to receive one, although every mail might bring it matter germane to its own, with statistical and other items worthy of more extended circulation. Ah! we are a wise—a wonderful people!

From the Boston Daily Evening Transcript.

We subjoin the remarks of the Hon. Marshall P. Wilder, promised yesterday, at the last Legislative Agricultural meeting at the State House:

The President introduced the discussion, by saying the subject was one paramount in importance to any other that concerns the cultivator of the soil. It is the great preliminary movement on which the farmer founds his expectations of a bountiful harvest, the sheet-anchor of his hopes. Although he might plough deep and well, yet, without some correct knowledge of the substances he uses to fertilize the seed he buries in the earth, his success is

almost as uncertain as the mariner's who would plough old ocean without chart or compass.

A soil of inexhaustible fertility, he said, was an imaginary idea; and although mother earth would yield kindly to the full extent of her ability, yet the time would come, sooner or later, when even the rich prairie lands of the West would demand a return of the fertilizing elements which have been abstracted by vegetation. It is a matter, then, of vast importance, to learn how these materials can be procured at the cheapest possible price, and in a form to be applied with the greatest economy.

Mr. Wilder proceeded to state that he was no chemist, and made no pretensions to farming, except as it is connected with gardening and the horticultural art.

He had made some experiments with manures, some of which he would relate. He did not wish to be understood that he undervalued stable or barn-yard manure, but such as was purchased from the stables of the city, by the cord, when deprived of straw or decomposed, was in reality only half or three-fourths of a cord. To obtain a real solid cord of manure, equal in quality, and at less price, had with him been a great desideratum, and he believed he had succeeded, by making a compost of meadow-muck, crushed bones, and leached ashes, in the following proportions:

One cord of meadow-muck, having been exposed to the action of air and frost at least one year	$1 50
Twelve bushels leached ashes	1 20
Six bushels crushed bones	1 50
Labor	30
Total cost per cord	4 50

The bones and ashes were mixed together while the latter were in a damp state; and when fermentation had taken place, these were incorporated with the meadow-muck. In this condition the mass should remain until heat is generated again, when it will be fit for use.

He had found this compost equal to any stable manure for root crops, grass land, gardening purposes generally, and for fruit trees. For the last two years, he had mixed his stable manure with the compost, and also had added to it one-eighth part in bulk of fine refuse charcoal from the depots of venders. This can be purchased at five dollars the cord, delivered, and does not much increase the cost above named.

Mr. Wilder said, that since Liebig first promulgated his opinion as to the wonderful influence of charcoal in rooting cuttings of plants, and as a component part of soils, experiments have been making verifying its importance. He also informs us, that the volatile gas which arises from our stables and manure heaps, and descends in the rain and snow, and which we call *ammonia*, is the great fertilizer of the earth. To secure this subtile element, Mr. W. had added charcoal to his compost heaps, and as he thought with great advantage. It is very durable, if not indestructible; a substance of great porosity, and we are told, he said, by chemists, that it will absorb 90 per cent. of its bulk of *ammonia;* but its beneficial effects are supposed to arise from its power of retaining this volatile gas, and yielding it up only as it is washed out by rains, or as the vital force of the root searches for food. He did not consider it a fertilizer in itself, but that it was a medium of administering nourishment, having used it with good success for greenhouse plants for many years.

Mr. Wilder said the compost (with the charcoal and stable manure combined) was the best he had ever used as a general manure. On fruit trees its effects were remarkable.

In the spring of 1847, he planted a square in the nursery with imported

trees from England, this compost having been spread and ploughed in. These trees were from four to five feet in height, and although it is not usual for trees to make a large growth the first year, they acquired branches of three to four feet, and were so handsome as to command $1.25 each for a row of fifty trees, without any selection.

In June last, which is very late to set out trees, he prepared another square on rather poor land, and planted trees just received from England upon it. The soil had been thrown up to the frost the previous winter, and the compost here was applied in the trenches, near the roots. Mr. Wilder exhibited two shoots, which had grown from those trees since they were set out in June. The shoots were four feet in length, and the wood hard and well ripened.

It is stated that on old beds, where charcoal had been burned ten years before, the corn and wheat to this day are uniformly better than on the adjoining lands, being more vigorous, of a darker green color, and producing larger crops. A farmer remarks, "I sowed fine charcoal over my grass land in strips; these strips have increased one-half in product, and without any apparent diminution for five years."

Mr. Wilder mentioned several instances showing the beneficial effects arising from the use of fine charcoal, one of which, in the State of New York, was an extraordinary product of wheat crop.

Says an English gardener, "My compost consists of nothing but loam and charcoal, without a particle of manure of any sort; and I never saw the plant that did not delight in it, and every plant under my care has some charcoal used about it."

As a deodorant or disinfector, Mr. Wilder related the following experiment which appears in a late English paper:

Two fluids, and charcoal from peat, were prepared especially by different chemists for the purpose of depriving night-soil, stable and pig-stye manures of their offensive smell—the fluids both proved ineffectual, but the charcoal not only entirely and instantly neutralized and destroyed the offensive odor, in each of these substances, but also deodorized the fluids themselves.

Mr. Teschemacher said that the vast and almost inexhaustible subject of manures had always united itself in his mind with three great considerations:

1. On the nature of the crops to be raised.
2. On the nature of the soil from which these crops were to be obtained.
3. And the most important one—the nature and application of the manure itself. He should be obliged to condense into a brief form what he had to say on all these heads. Every one knew, if clover was wanted, a large quantity of lime was wanted; for tobacco, potash or soda.

In England, after many years' cultivation of wheat, all the cow-yard manure that could be heaped on the ground, would not raise any more until bone dust was added; and with this many acres, hitherto considered barren, had given excellent crops. The size and quality of turnips had been found to be much benefited by the use of the soluble phosphate of lime.

One question then is, what does the crop we require abstract from the soil during its growth and maturity? This question is answered by the various analyses of the crops which are now found in every agricultural treatise. But another and much more important question now arises: it is this:

What part of the ingredient puts more bone and muscle into the animals which feed on them, and can we by particular measures increase in these crops the quantity of their ingredients? The first part of this question has been answered by Liebig's last treatise. We knew before Liebig was born

that the bones of animals were chiefly formed of the phosphate of lime, but we did not know that the phosphates of other alkalies formed considerable part of the muscle; this he has satisfactorily proved. In the lime district of Switzerland the cattle are much larger than where lime is scarce in the soil—and the great test of the quality of a crop is by its nutritious action on the animal, more than by its appearance or even weight; now it is evident that by offering as food to these crops a manure abundantly supplied with these ingredients, *combined with others insuring a luxuriant growth*, we enable them to obtain a maximum thereof. My experience shows in the same weight of grain a difference of thirty per cent. in their ingredients, dependent on the difference of the manure; hence the consideration in the nature of the crops is of much interest. On the nature of the soil—All soils are composed chiefly of sand (silica), clay (alumina), lime, magnesia, some organic matters as sources of carbonic acid, and a few oxides of the metals.

Sand (silica) is chiefly of use to strengthen and stiffen the stems; for this purpose it must be dissolved by an alkali, (potash or soda.) This is usually found in clay, which as an ingredient of the soil or of the compost heap, is invaluable, although it never enters into the organization of the plant.

When the chemist analyzes a mineral containing alumina, it is almost impossible for him to wash it free from the alkaline substances which he has used in his analysis—it grasps and retains these with the most invincible obstinacy, as clay in its natural state is always combined with small portions of silica and potash or soda.

The President has spoken highly of charcoal, but by no means too much so, as an absorbent of the useful part of manure—ammonia. I have experimented several years with this substance, in various ways, and can amply confirm all he has said. Clay, however, I think if possible more retentive than charcoal, certainly more so as regards potash and soda, and may be had where charcoal is hardly to be procured. Clay, then, well pulverized by frost, is a most valuable addition to the compost heap; and a soil containing a fair proportion of clay may, by manuring, be rendered the most permanently rich of any.

A light soil allows the valuable salts of the manure easily leached through by heavy rains, and one with too much clay does not permit them to mix freely, so that the roots of the crops can get access to their nourishment.

The farmer, who studies the nature of his soil, will, while manuring liberally, be able to manure much more economically, than one who knows nothing on the subject. It is probable that the great differences of opinion which exist in the use of lime and plaster have arisen chiefly from ignorance on this subject.

I have not time to dwell on the third part of this subject, but will state that in the Isle of Thanet, on the river Thames, where much seed wheat is grown, and where seeds of vegetables and herbs are grown to a large extent, the compost heaps are formed as follows: three or four inches of pretty good loam and turf, then six or eight inches of sea-weed brought up from the beach in the immediate vicinity, then six or eight inches of farm-yard manure, then loam, and so on, until the heap is several feet high. This is left twelve months to decompose—the grains raised are beautiful, large, plump, and heavy—now here the ingredients are clayey loam to absorb—sea-weed contains soda and a good proportion of the phosphates—the barnyard manure besides its soluble salts contains ammonia, and the solid parts are by fermentation converted into charcoal and humus, which absorb the ammonia and preserve it for the use of the crop. Here then is not only every ingredient the plant requires, but also the storehouse of alumina and charcoal, from which it extracts its food as wanted.

I remember a discussion on the subject of whether manure was better used in a green state or after it had been kept for a year or more and had become a black saponaceous mass. The question appeared to be settled in favor of this latter state, and this agrees with my own experience. If a manure heap be fermented under a good cover, it is converted into a black carbonaceous mass, containing nearly all the ammonia condensed in its pores, and is a most powerful manure.

But, gentlemen, I will not continue this subject. I am still a learner, and shall be happy to acquire knowledge from gentlemen present.

Lieut. Governor Reed, Hon. Mr. Brooks, of Princeton, Hon. Mr. Leonard, of Norton, Hon. J. C. Gray, Messrs. Buckminster, of "The Ploughman," Bartlett, of "The Cultivator," and other gentlemen, took part in the discussion.

The same subject of manures is to be resumed next Tuesday evening.

IRON BUSINESS IN VIRGINIA.

"We noticed a few days since, and with gratification, too, a statement in the 'Lexington Valley Star,' of the prosperous condition of the iron establishments in the county of Botetourt, Va. We were gratified, that these manufacturers were able to sustain themselves against the ruinous free trade policy of our government, even though those of our own State could not. But it seems the statement was erroneous, in some respects, at least, for the 'Fincastle Whig,' in correcting it, says, 'we feel satisfied that there is not a businessman in the country, but is convinced of the fact, that every man engaged in the iron business in Botetourt for the last twelve months has lost money by the operation. Out of the five furnaces enumerated by the 'Star,' in the county of Botetourt, as being in a *prosperous condition—two*, if not *three*, under the blighting effects of the *British Tariff* of 1846, have been compelled to stop business—and in some cases, their proprietors, formerly independent, are now bankrupt. So much for the operation of the *Free Trade Tariff* in the county of Botetourt. We have no doubt the same is true, not only in relation to other counties in Virginia, but throughout the whole Union.'"

What is the comment of a genuine "Common Sense" on the above? Must not those who worked in those furnaces be converted from being customers to being rivals of the farmer?—and must not the farmer, instead of finding his market on the spot, and saving his time, and keeping his manure on the farm—must he not go to making corn and wheat, that must be sent at great expense to distant markets, there to meet the competition of men who live on *pumpernicle*, and who are bought and sold with the farms to which they belong, as so many cattle and sheep?—for such is the condition of millions in Russia, our great rival in the corn markets of Europe.

DEPOPULATION OF THE SOUTH.

"An unusually large number of movers have passed through this village within the past two or three weeks. On one day of last week, upwards of thirty wagons and other vehicles belonging to emigrants, mostly from Georgia and South Carolina, passed through on their way, most of them bound to Texas and Arkansas."—*Greensborough (Ala.) Beacon.*

Everywhere throughout the South, men are thus seen flying from each other, and from rich soils. The address of Governor Seabrook to the Agricultural Society of South Carolina, recently received, and which we propose, on a future occasion, to notice at full length, describes as existing throughout that State, an amount of rich and unoccupied lands that perfectly astonishes us; yet her people are seeking the West, to repeat upon poor soils, at the heads of streams, the work of exhaustion. To clear the rich lands of the river bottoms, and to drain the swamps, combination of action is indispensable, and that can never be obtained until the loom and the anvil are brought to take their places by the side of the plough and the harrow.

WHAT MAY BE DONE WITH EASTERN SHORE OF MARYLAND LAND,

FROM WHICH PEOPLE ARE RUNNING AWAY TO THE WEST, OR INTO THE LARGE TOWNS.

Martin Goldsborough's Statement—with Notes by the Editor of "The Plough, the Loom, and the Anvil."

Lot No. 1. On the plot, 1 acre, 1 perch, from which I cleaned up 50 bush. 10 lbs., which is 40 bush. 8 lbs. per acre.

Land, white oak soil.(*a*) Improved in 1835, kept in grass for 7 years, then in wheat until 1847, when I had a good growth of clover. I grazed it off, broke the land in July, which was done as shallow as I could: say 1½ to 3 inches deep, then prepared with treble ploughs.(*b*) Seeded and put in with the same ploughs on the 17th or 18th of October, 1847.

S. Chamberlain's Plot.

	A. R. P.	bush. lbs.
Lot No. 2 is made up of	1 1 20	Product 44
Lot No. 3 is made up of	2 1 20	" 70
Lot No. 4 is made up of	1 3 00	" 64 24
	5 2 00	178 24

Giving 32 40 to the acre.

Ground, white oak soil, prepared as above, seeded as above; and on lots 3, 4, had a light dressing of manure.

Lot No. 5 contains 5 acres 18 perches; product 150½ bush., which is about 30 bush. per acre.

Land, part loam, part white oak, prepared as in No. 1. Seeded in three different lots, 17 bush. of wheat—*Closs wheat.*

1 acre of corn produced 75 bush.

Land, loam, 3 years in succession in wheat, the 4th year in corn, and gave the above. Planted 4 ft. 4 in. by about 3 ft. The ground had a dressing of marsh-mud and sand, and farm-yard manure—about 90 loads of the former and 45 of the latter per acre. Broken in May, and planted on the 20th. There was 172 missing hills on the acre, and many hills with but one stalk.

I will make oath to these statements if required.

Talbot County, Md. MARTIN GOLDSBOROUGH.(*c*)

(*a*) It were much to be wished that this "white oak soil,"—a common designation in Maryland—could be more exactly described. It is not enough to say that its primitive growth was white-oak. It ought to be, and doubtless will be, analyzed carefully, and the results published, by the State Agricultural Chemist. The soil of what is emphatically called "The Swamp," on West River, is a white-oak soil, which, after rain, runs together in a hard compact mass, causing it to be called *pewtery*. It seems to be unmixed with sand, and when dry rubs into an impalpable smooth powder, like wheat flour. The original growth of that land is celebrated over the country as the finest description of white-oak ship timber—the next best timber after live-oak. Can Mr. Goldsborough's "white-oak soil" be of the same description? Both are, we presume, flat countries. The swamp certainly is, and underlaid with a thick stratum of a yellower or brownish clay, almost as hard as stone.

(*b*) There is coming into fashion in Maryland, an implement arranged with two, three, and we believe even four or five little ploughs, arranged a little in advance of each other, and at an angle across the land, so that the one in the rear runs just clear of the land thrown by the one in advance. They run, of course, very shallow, and are getting to be very popular for seeding grain in fallow land. Perhaps after some time, when a few more thousand of the "Plough, the Loom, and the Anvil" get into circulation, as it now circulates, not locally, but over the whole Union, the makers of agricultural implements will wake up to a sense of the benefit they might derive from advertising on the cover

of this journal, and sending for insertion in it, gratuitously, all descriptions and cuts illustrative of *new* agricultural inventions. We have only to add that this is a matter that concerns them more than us. One word more: the nearer the loom and the anvil come to the plough, the better both for him at the plough, and for *him who makes it*.

(*c*) We hope never to see a Maryland farmer called upon or allowed to "make oath" to the truth of a positive statement—for with the farmers of that State, we hope never to see any man dare come in competition, who would not be believed by his neighbors as implicitly on his simple word as on his "affidavit:" the very form of which is, in some States, carefully conned over and prescribed, to tie down competitors for dollar premiums, in the strictest terms that suspicion could devise against a known habit of lying and fraud.

In still further proof of what land will *fetch*, in more senses than one, on the Eastern Shore, we take, without leave, the following extract from a letter received some weeks since from a valued friend in Talbot County. Though the letter was a friendly one, designed only for our own eye, the facts are of public interest, and he must excuse us, as we omit names. What he says of sea-weed, or sea-ware, sometimes improperly called kelp, (which is altogether a different substance,) reminds us of some experiments detailed to us, many years since, by a most respectable farmer, and which we will relate when we have room.

"What do you think of land selling within four miles of here for $60 an acre? I know an instance of it, and the purchaser is a hard-fisted, working farmer, who has made a small fortune by hard knocks, having come in, as the sailors call it, at the 'hawse-hole.' The farm is not rich, but for beauty of situation cannot be surpassed. ——— bought a good farm three miles below St. Michael's, a few days ago, at $40 an acre. It is considered a good purchase, but situated on the waters of Choptank, where there is no sea-weed, which we consider as indispensable as the Virginians do a mint-patch.

"I killed, a few days ago, 38 hogs, which averaged 215 lbs., raised in the way you most approve, on principles of the 'largest liberty,' and none exceeding 18 months old, and many about 12 months. Three raised in a stye weighed from 300 to 380 lbs. (15 months old). How the Yankees can make them weigh, at 16 and 18 months old, from 500 to 600 lbs. I cannot imagine. Next year I shall make an improvement on my stye, by giving the pigs access to a marsh in warm weather, which I think will conduce to their health.

"I made an experiment this year of a compost made of king-crabs, which abound in these waters. I do not know whether you are acquainted with this interesting testaceous animal, but think you must have it on the Patuxent. I mixed them with rough straw, soil, &c., and the appearance of the manure is rich,—the crabs, shells and all, decomposed. I made also 294 loads of prime manure *under my sheep*, to say nothing of my main summer compost, in which I penned my cattle from May until November, on the usual materials, sea-weed, woods leaves, straw, &c., and *lubricated* with 1300 skates. An experiment I made with guano on wheat was not successful.

"I wonder you have not drawn some matter from Humboldt's New Spain. In the 2d volume is a beautiful essay on the agriculture of that country. There the origin and progress of the potato is discussed, and its failure, from cutting the seed, predicted. He wrote in about 1803 or '4."

Notes on Pigs.—The great weight at which the Yankee *pigs* arrive at an early age, is no doubt the result, in a great measure, of *peculiarity in the breed*, and then again difference in the manner of rearing.

In New England, every meal the hog eats *costs money*, and the Yankee has the sagacity to *count the cost* of every thing. The hog there never goes at large, whereas, at the South, he goes routing and grunting where he listeth—oftentimes turning up his master's meadows, sometimes luxuriating in his corn-field, and sometimes feasting even on the dainties of the garden. But why not, says the reader, get these New England pigs in the South? Because "circumstances alters cases," and besides, it *has been* done, again and

again. The fat, short-legged, simple-hearted pig of New England, that waits to be fed, and, unlike his countryman, knows not, nor ever dreams how to weather difficulties, would perish in the sunny South, where the rule is "Root, hog, or die." There the hog is remarkable for his industry and enterprise. How long would it take a fat New England pig to run a mile in time of a North-wester, to pick up a shower of chestnuts or acorns in one direction, and as far in another to the persimmon trees? "It's an ill wind that blows nobody any good," but no wind can blow good to hogs that can't go in search of what the wind throws upon the ground. The New England hog, from the day he is littered to the day he breathes his last, is kept stuffed with as much as he can eat. His is not a life of vicissitude and romance—of starvation and satiety. It is one monotonous alternation of *sleeping and eating*, and as, in New England, where the loom and the anvil are everywhere near to the plough, *every thing* can be sold and turned into money, the Yankee knows he must have a breed that will yield the greatest weight of fat pork in the shortest possible time—for he can estimate the money value of every pint of buttermilk he eats, and of every apple. Get the same breed in Maryland, and treat them in the same way—keep them *always* pampered—let them never wake but to eat, and keep them always clean, and you can have them weigh as much, and in as short time, as the Yankee pigs, of which here are some memoranda. For instance, Mr. Bingham, of Cambridgeport, killed four pigs of one litter, one year and one day old, which weighed

306, 318, 394, and 398. Total, 1470.

Mr. Amos Wood, of Boston, bought a sow that then weighed 596 lbs., one year afterwards she weighed 1106, having gained 510 lbs. in 365 days. Her food was varied every day, and once every week she had a salt fish, and the water it was boiled in. At Easton, (not Maryland, but) Bristol, Mass., Mr. Cyrus Lathrop killed a pig which at twenty months old weighed 742 lbs. He measured 9 inches through the ribs, was 5 feet round the neck, 7 round the body, and was 6 feet 2 inches long. He was unpromising *as a pig*, but *took a start* in April, and gained in one year 665 lbs.! Let us hope that, as money is so hard to be raised for agricultural uses, that societies will give away no more premiums for fat hogs unless it be "with a proviso!" that they shall exceed some of these old familiar cases, of which, while our hand is in, we will give a few more. Thirty years ago, there were slaughtered in Boston, on the day they had been but one year in this world, eating and drinking, ten brothers and sisters, which weighed *three thousand seven hundred and sixty-three pounds*, or an average of 376. They were purchased at five weeks old, by an innkeeper, and fattened in his stable-yard. They were fattened on the wash and refuse of the tavern kitchen, until November, when they got, besides, until they "bit the dust," about ninety bushels of corn meal!

A Note upon a Note.—The reader will do well not to infer from the above, that common "pot liquor," in which hog meat has been boiled, and from which it chiefly derives its substance, is good for *hogs*. In relation to the very case just stated, we once received the following:

"MR. EDITOR:—In compliance with your urgent request, I proceed to state the substance of my remarks, in conversation with you, concerning the effects of certain kinds of feed on the constitutions of the hog and the cow.

"And, first of the hog: I have observed that the common pot liquor, from the boiling of pork or bacon, to be injurious to confined hogs, and of no benefit (if not an injury) to those running at large. In my opinion, it produces a disposition to mange. I think that the large hogs, fed in Boston, by Mr. Patterson, with kitchen swill, must have had but little pork in its composition.

"And next of the cow. I was informed, by an old gentleman who practised the veterinary art in Baltimore, for several years before his death, that he believed that most of the complaints of the cows in Baltimore, originated from feeding on slops, composed in part of the boilings of beef and pork. I bought some Baltimore cows one Fall, and found them much weaker and more difficult to winter, for their appearance, than any I ever fed; and it is my opinion, that this disposition was produced by feeding on such slops as I have above described. And I am of the opinion, that it is contrary to nature and injurious to the health and constitution of any animal to feed on its own kind. The best feed I have ever given to hogs is milk; and it is, at the same time, the worst for dogs. Rich pot liquor will fatten dogs, and

kill hogs. If these observations are considered worthy a place in your paper, you may insert them. A ROUGH FARMER.

"*St. Domingo Farm, May* 21, 1819."

In the Baltimore market, thirty years ago, there were two hogs exhibited by John Harburger, of Lancaster County, Pa., that weighed 1743 pounds. One girted 6 feet 3, and one was 9 feet 1 inch long, from the root of the tail to the end of the snout. One was 18, the other 14 months old. The last six months prior to their being weighed, they had been fed entirely on *milk and corn*. What better could they ask? The above was their *live weight*. What the difference is between gross weight and weight when cleaned, with other particulars interesting to be known to every practical farmer, but which not one farmer out of an hundred can tell, off-hand, may be learned from the following, with which, for the present, we conclude our swinish notes. The information was given thirty years ago, to the Senior Editor of "The Plough, the Loom, and the Anvil," by a "*Statistical Philosopher*" of Princess Anne, Somerset County, Maryland; and for fat turkies, good oysters, good apple-toddy, fox hunting, and card playing, (we mean fifty years ago, in old Col. W*****'s time,) a man might go further and be in a worse place than Somerset County—for "peach" you would go still lower down into the Old Dominion—down into friend Wise's bailiwick.

I have inspected the memoranda of a practical economist for a series of years, and from a variety of experiments have formed the following table of ten hogs, fatted chiefly on corn.

Days of fatting	45
Weight, when put up	1257
" when killed	1728
" when cleaned	1366
Weight of hams, shoulders, and middlings	909
" of hams and shoulders	752
" of leaf, fat	138
" of feet, heads, and backs	319
" of hams, shoulders, and middlings, when smoked	733
" of hams and shoulders, when do.	607

Hence it appears that the gain in fatting is nearly one pound per day.

In relation to the entire hog the	loss in cleaning	20
	hams, shoulders, and middlings	67
	hams and shoulders	55
	leaf, fat	10
	loss in smoking	20

per centum.

SHEEP-KILLING DOGS.

"Alone, in wanton mischief he pursues
Alone in reeking blood his jaws imbrues;
Chasing amain, his frighten'd victims round,
Till death in wild confusion strews the ground;
Then, wearied out, to kennel sneaks away,
And licks his guilty paws till break of day."

THE Ohio State Board of Agriculture held its annual meeting at Columbus on the 6th of December, and evinced a very laudable sensibility to the importance of their duties: nor could that be better done than by the re-election of Mr. ALLEN TRIMBLE as President. They determined to hold a State Fair in the month of September next—the place not yet agreed upon, recommended the patronage of agricultural papers, and the "Ohio Cultivator" in particular; also that the proprietors of newspapers would devote a portion of their journals to agriculture. It is just this which will at last destroy the attempt by appropriate journals, devoted exclusively to the subject, to establish an agricultural literature for the country. In the first place, farmers care so much less for knowledge of principles and progress in their own business, than they do for *party* politics, that where twenty party papers do well at from $3 to $10 a year, even Bateman, with all his

industry, can hardly keep his "Cultivator" going at $1; yet these half-supported, half-starved agricultural journals, furnish the materials for the agricultural department of the party papers. What ought to be thought of the man who calls himself a man and a father, who is rearing his sons to be cultivators of the soil, and who yet hesitates to lay aside $5 a year for agricultural journals designed to instruct them in the very business by which they are to gain a livelihood, and *respectability* by some knowledge of the principles of their profession! We ask every farmer who is a father to put the question to himself! But of all this we had no design to say one word; so we return to the proceedings of the State Convention, only to note, for the present, some of its most important resolutions, as follows:

"Resolved, That the President of this Board be authorized to offer a premium of *Fifty Dollars* for the best essay on the character, composition, and improvement of Soils in Ohio.

"Also a premium of Fifty Dollars for the best essay on the relation that the agricultural, manufacturing, and mechanical interests sustain to each other. The essays to be furnished on or before the day of the next annual meeting of the Board.

"Resolved, That Messrs. Springer, Medary, and Sullivant, be appointed a committee to report to the next meeting of the Board, a select list of fruits best suited for cultivation in the northern, central, and southern portions of this State, with such remarks on the subject of pomology as the committee may deem proper.

"Resolved, That this Board ask the Legislature at its present session to pass a law requiring the township assessors to ascertain as correctly as possible the amount of each kind of grain and other farm produce raised in each township annually, together with the number of acres of land occupied with each kind of crop.

"Resolved, That inasmuch as great damage is annually done by dogs,* in the destruction of sheep; and consequently many of our agriculturists suffer great loss or are deterred from engaging in this branch of agriculture therefore, this Board memorialize the Legislature, at their present session, to pass a law imposing a *tax on dogs*, of such sum as they may deem necessary, to protect the interests of the wool-growers of Ohio.

"Resolved, That the President of this Board be requested to procure some suitable person to deliver an Address at the State Fair to be held next September."

Now supposing the loss in other States to be in proportion, and taking the census of 1840 for the number of sheep, and the annual loss by dogs is $600,000, or the interest on a capital of $6,000,000; but it seems that Ohio has, since 1840, increased her flocks of sheep from 2,028,401 to 3,677,171: at that rate, by the next census she will have 4,000,000 of sheep. Surely the owners of that amount of property ought to be able to contend against the owners of sheep-killing dogs, in a contest for influence even with the most rabid hunters after popularity and office on the part of law-makers!

GROWTH OF AGRICULTURAL WEALTH IN OHIO.

		Horses and Mules.	Cattle.	Sheep.	Hogs.
In 1838	. . . .	430,527	1,217,874	2,028,401	2,079,746
In 1848,	Horses, 492,509 / Mules, 2,098	494,607	983,822	3,677,171	1,879,689

The apparent diminution in cattle and hogs is explained by the following note from the "Ohio Cultivator," from which these returns are taken. The enumeration was probably made after the sheep of the last lambing season were six months old, so that we have nearly the whole number of them; but very much less than the actual number of horses, cattle, and hogs.

Note.—The foregoing table does not include horses and cattle under two years old, mules under one and a half years old, and sheep and hogs under six months old, on the first day of June last.

Total value of Horses, $16,856,841. Total value of Mules, $78,955. Total value of Cattle, $9,729,920. Total value of Sheep, $1,988,316. Total value of Hogs, $2,341,106.

* In 1846, the estimate was $80,000, as the value of sheep killed by dogs in Ohio that year. One farmer had fifty killed in one night.

CULTIVATION OF COTTON IN INDIA.

In former articles we have endeavored to extract some principles as applicable to the successful culture of American Cotton. The chemical constituents of the soil did not, upon the whole, appear to be of greater importance than its physical state. A high degree of summer temperature seemed essential, with, at the same time, considerable though not excessive moisture. The practices of agriculture seemed indeed to be varied chiefly in reference to the more or less moist state of the atmosphere. The quantity of cotton required by our manufacturers being so immense, it is not extraordinary that they should wish to be supplied from a variety of sources. India has generally been looked to as the country most likely to supply a greatly increased quantity in a short space of time; chiefly because it already produces largely not only for the consumption of its millions of inhabitants, but also for export both to this country and to China. But the quality of Indian Cotton not being generally approved of by our spinners, it has been thought that careful culture might improve its nature, and also that where one species was so extensively cultivated, another might be successfully introduced, especially into a country which is so frequently described as including every variety of soil and climate.

It would be extraordinary if no attempts had been made to attain so desirable an object as the production of an article greatly in demand in Europe, and which would appear to be of benefit to the country producing it as an article of export. On inquiry, indeed, we find that a vast number of experiments have been made by the East India Company for a long series of years, indeed from the year 1788 to the present period, and in spite of failures enough to have deterred most other governments from persevering in what appeared a hopeless undertaking. These experiments commenced with inquiries, and were followed up with the distribution of seeds to cultivators, and the establishment of government farms: the despatch of planters from America for growing the cotton in India, as well as of machines for cleaning it, and of presses for packing it. These were followed by a repetition of the same measures at successive times, and in new localities; and, if we except some very recent ones, all without any great effects having been permanently produced. The efforts of the government have been aided by the co-operation of Agricultural Societies, as well as of individuals in different parts of India, and all with no better success, and this in a country where the same efforts have established the manufacture of indigo and of sugar, and improved the preparation of silk, and the collection of opium.

India is so vast a country, and its different parts vary so much from each other, that it will be difficult to make any observations which are equally applicable to all; we shall therefore divide our inquiries into these experiments, and our observations on them into certain great divisions of the country, where there is some general similarity of soil and of climate, without paying any great attention to a chronological series. First of all we shall notice the province of Bengal, not that it is peculiarly a cotton country, or that its cotton is of a superior quality, though Dacca, one of its districts, was long celebrated for its muslins. We must premise, however, that the province of Bengal has nothing to do with what is commonly called Bengal cotton, which is produced, we believe, entirely in the distant and dry north-west provinces, and exported from Calcutta, the capital of Bengal. But we select Bengal because it affords the requisite temperature, is near the sea, and is conspicuous for moisture of climate. Numerous experiments, more-

over, on the culture of cotton, have been made, by individuals, by the Agricultural Society of India, and by two of the American planters, within its limits. A notice of its climate may prove interesting to horticulturists, as the Botanic Garden of Calcutta, from which so many plants are received in this country, is situated in and is under the influence of the climate of Bengal.*

The province of Bengal, now divided into several districts, lies between 21° and 27° of N. latitude, and is about 350 miles in length, with an average breadth of about 300 miles. It is throughout a flat champaign country, bounded to the S. by the Bay of Bengal, and the dense forests, intersected by numerous rivers, called the Sunderbunds. The northern frontier, which runs westward from Assam, is formed by a belt of from 10 to 20 miles in breadth, of a tall grass and tree jungle, which runs along the foot of the lower Himalayas. On the east it is bounded by the Cossya hills and other low ranges in Tipperah and Chittagong, while the west is confined by the low hills which stretch from Rajmahl towards Birbhoom and the Jungle Mehals. This wide expanse of plain is intersected by the mighty Ganges, the wide-spreading Burrampooter, and by numerous other navigable streams, which, however, often change their course, washing away an estate in one place, covering another with sand, and leaving some intermediate part a stagnant marsh. These rivers, moreover, overflow their banks about the month of August, and inundate the country to a great extent. In autumn they drain off, but as the agriculturist wishes to retain a supply of moisture, embankments are made to retain the water even over extensive fields. Besides these, there are numerous tanks and jeels, *i. e.* "shallow lakes or deep morasses," so that every thing tends to increase the moisture of the climate. But the effects of a raging sun with drought are occasionally felt, when "the earth is iron and the sky brass."

The seasons are divided, as over a great part of India, into three: that is, the hot, the rainy, and the cold. The hot weather begins with March, and steadily increases until the rains come on, early in June. But occasional storms, with rain, occur, which relieve the intensity of the heat. During the first two months of the rains, the falls are incessant, but during the two following months intermissions are frequent. On an average, 60 inches of rain are said to fall in Calcutta, but Prinsep gives 59·83 as the average for three years. If the rains cease early in September, intense heat is experienced, men become sickly, and plants languish. As the weather becomes colder, the moisture which is evaporated during the day is deposited during the night, and fogs obscure the sun till late in the morning. The cold being

* Calcutta, the capital of Bengal, in lat. 22° 23′ N., and long. 88° 28′ E., and situated only a little above the level of the tides, has a mean temperature of about 78°.

Jan.	Feb.	March.	April.	May.	June.
66·2	69·8	80·0	85·4	85·7	83·7
July.	**August.**	**Sept.**	**Oct.**	**Nov.**	**Dec.**
81·8	82·0	82·8	79·2	74·2	66·6

The thermometer ranges from about 45° to 75° in the cold season, when a dry wind blows from the N.E. in the day; but at night there is dampness with cold. In the hot season, or from the beginning of March to the middle of June, the temperature rises gradually from 80° to about 90°—95° in the shade, and reaches to 100°—110° in the open air. Though no rain falls, the wind blowing from the S.W. is loaded with moisture in its course over the Bay of Bengal. In the rainy season the temperature is high and equable, but the Orchid-house-like climate is oppressive, from the combination of heat with moisture, and still more exhausting when, towards the latter half, the wind veers to the S.E.

combined with moisture is felt as severe but not invigorating, and though the thermometer does not fall to the freezing point, ice is obtained by exposing shallow vessels to the effects of the free radiation which takes place in the more open parts. In the more eastern districts showers are more frequent during the dry months of the year, but the moisture of the climate is still greater, and increased by the exuberant vegetation and clumps of trees in even the cultivated parts, while on the frontiers this is still more the case: the dense forests and jungle of grass, often 20 feet high, not only add aqueous vapor to that already in the atmosphere, but prevent the free evaporation of water from the undrained surface.

In such a climate we may expect that wild animals will abound and insect life be rife. The farmer, indeed, complains that tigers and leopards carry off his cattle, wild hogs crunch his sugar-cane, and birds destroy his seed when sown, and his grain when in the ear. But from the peculiarity of climate he can easily obtain two crops off the same field, one being rice or other cereal, the other some one of the numerous millets, pulses, or oil-seeds. He also cultivates the sugar-cane, indigo, mulberry, tobacco, safflower, &c.; but prides himself especially on his clumps of mangoes and of bamboos, or his plantations of cocoa-nut, areca, or wild date, the last valuable only as yielding sugar, while the bassia affords saccharine matter in its flowers for an intoxicating liquor, and a valuable oil in its seeds. In such a climate the culture of a plant like American cotton, which requires heat and moisture, does not appear to be impracticable.

EFFECTS OF FREE TRADE IN CANADA.

The aggregate value of manufactures exported from Great Britain to all the British North American Colonies, for seven years, is as follows:

1840	£2,847,963	1844	£3,044,225
1841	2,947,061	1845	3,550,614
1842	2,333,525	1846	3,308,059
1843	1,751,211		

During these years there has been a constant stream of population to these provinces, yet their power of consumption does not increase. With the exception of a few small woollen factories, they have scarcely any thing like manufactures. They have the most perfect freedom of trade with England, and yet their consumption, per head, appears to have been less than in 1840. They return to the land nothing of what they take from the land, and they grow poorer instead of richer. Therefore it is that the farmers of Canada are now seen transferring themselves to the Western States, that they may enjoy at least that amount of protection which is afforded by the tariff of 1846, insufficient as it is to exercise that attractive power which would draw the loom and the anvil to take their true and natural places in the vicinity of the plough and the harrow.

The *increase* in our consumption of bar, pig, and railroad iron, without taking into consideration the value added by subsequent processes, between 1843 and 1847, was equal to the *whole consumption of British manufactures* in all her North American possessions. Would it be possible to produce a stronger fact to illustrate the effect that is produced by the approximation of the consumer and the producer?

Were these colonies free, their first step would be that of having a tariff of protection. They have free trade, by which they are ruined. We had protection, by which we were becoming rich, but our farmers and planters did not appreciate the fact that protection is, and always must be, *a farmer's and planter's measure.*

[Entered according to Act of Congress, in the year 1849, by JOHN S. SKINNER & SON, in the Clerk's Office of the District Court of the Eastern District of Pennsylvania.]

THE AGRICULTURAL SCHOOL-BOOK.

SECTION I.—CATECHISM OF AGRICULTURAL CHEMISTRY AND GEOLOGY.

FIRST LESSON.

1. AGRICULTURE is the art of cultivating the soil.

2. The object of the farmer in cultivating the soil is, to raise the largest crops, at the smallest cost, and with the least injury to the land.

3. For the intelligent cultivation of a farm, a knowledge of the nature of the crops raised upon it, of the soil upon which they grow, and of the manures applied, is absolutely requisite.

Fig. 1.

I.—OF THE NATURE OF THE CROPS RAISED.

1. All vegetable substances consist of two parts, one which burns away in the fire, called the organic part, and one which does not burn away, called the inorganic part.

Here the teacher will burn a bit of straw or wood in the candle, (fig. 1,) and show that one part burns away, and that another *very small* part—the ash—does not burn away.

2. In all vegetable substances the organic part is very much the greater. It forms from 90 to 99 out of every 100 lbs. of their weight.

II.—THE ELEMENTARY SUBSTANCES FOUND IN THE ORGANIC PART OF PLANTS.

1. The organic part of plants consists of four elementary bodies, known by the names of carbon, hydrogen, oxygen, and nitrogen.

2. Carbon is a solid substance usually of a black color, which has no taste or smell, and burns more or less readily in the fire. Wood-charcoal, lamp-black, coke, black-lead, and the diamond, are varieties of carbon.

The teacher will here exhibit a piece of charcoal, and show how it burns in the fire, or in the flame of a candle. He may also draw the attention of his pupils to the remarkable difference in appearance between charcoal and the diamond, though essentially the same.

3. Hydrogen is a kind of air or gas which burns in the air as coal gas does, but in which a candle will not burn, nor an animal live, and which, after being mixed with common air, explodes when it is brought near the flame of a candle. It is also the lightest of all known substances.

Fig 2.

Here the teacher will take a goblet or champagne glass, will put into it some pieces of zinc or iron filings, and pour over them a small quantity of oil of vitriol (sulphuric acid) diluted with twice its bulk of water, and then cover the glass for a few minutes. On putting in a lighted taper, an explosion will take place. He will then repeat the same experiment in a phial, into the cork of which he has introduced a tube, (say a bit of the stem of a clay pipe—fig. 3.) After a short time, when the hydrogen gas produced has driven out all the common air from the bottle, a light may be applied to the jet, when the gas will take fire and burn. The cork and jet may now be taken out of the bottle, and a lighted taper be introduced into it, when the taper will be extinguished, while the gas itself will take fire and burn at the mouth of the bottle.

Fig. 3.

Lastly, if the teacher possess a small balloon, he may fill it with the gas by attaching it to the mouth of the bottle, and may thus show that the gas is so light that it will carry heavy bodies up with it through the air.

4. Oxygen is also a kind of air or gas. A candle burns in it with great brilliancy; animals also live in it; and it is heavier than hydrogen gas or common air. It forms one-fifth of the bulk of the air we breathe.

Fig. 4.

The teacher will here exhibit a bottle of oxygen gas, (fig. 4,) and show how rapidly and brilliantly a lighted taper burns when introduced into it. The least troublesome mode of preparing oxygen gas is to rub together, in a mortar, equal weights of oxide of copper and chlorate of potash, to put the mixture into a common Florence flask, and to apply the lamp as in fig. 5.

Oxide of copper is prepared by heating a piece of sheet copper to redness in the fire, allowing it to cool, and then striking it with a hammer, when scales of oxide of copper fall off. The oxide employed in the preparation of the gas may be washed out of the flask, and employed again for any number of times.

When prepared in this way, the properties of the gas may be shown in the flask by introducing a lighted taper or a bit of red-hot charcoal at the end of a wire. Or if the teacher wish to collect a bottle of gas, he may do so by fitting a bent tube and cork into the mouth of the flask, (see fig. 11,) and collecting it over water, in the same way as when a retort is used. See fig. 7.

A very elegant method of preparing the gas is to put a few grains of *red oxide of mercury* into the bottom of a test tube, and to apply the heat of a lamp. Oxygen will be given off—as can be shown by putting into the tube a half-kindled match, and showing how rapidly it burns up—while metallic mercury will distil off in brilliant minute globules. This experiment the teacher may use to illustrate the meaning of the word *oxide*. (See page under Oxide of Iron.)

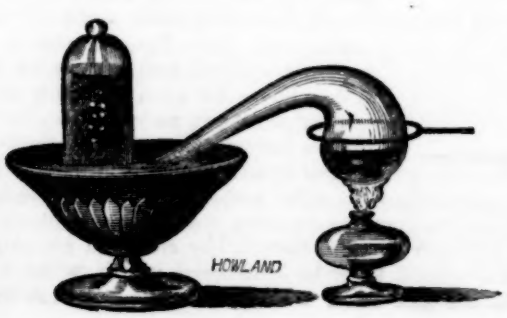
Fig. 5.

5. Nitrogen is also a kind of air differing from both the other two. *Like* hydrogen, a taper will not burn nor will an animal live in it; but *unlike* hydrogen, it will itself not burn, and therefore does not take fire when brought near the flame of a candle. It is a little lighter than atmospheric air, of which it forms four-fifths of the bulk.

The teacher will here exhibit a bottle of this gas, and show that a lighted taper is extinguished when introduced into it, (fig. 6.)

Fig. 6.

Fig. 7.



The easiest mode of preparing nitrogen is by mixing together a quantity of sal-ammoniac with half its weight of saltpetre, both in fine powder, and heating them in a retort over a lamp. The gas which comes off is collected over water. See fig. 7

6. The greater number of vegetable substances contain but three of these elementary bodies, viz. carbon, hydrogen, and oxygen.

7. Among the more common substances which contain only these three, we may enumerate starch, gum, sugar, the fibre of wood, oils, and fats.

QUESTIONS.

AGRICULTURE.

1. What is agriculture?
2. What is the object of the farmer in cultivating the soil?
3. What ought the farmer especially to know that he may work intelligently?

THE NATURE OF VEGETABLES.

1. Of what parts do all vegetables consist?
2. Which of these two parts is the greater in quantity?

ELEMENTARY SUBSTANCES CONTAINED IN THE ORGANIC PARTS OF PLANTS.

1. Of what elementary bodies does the organic part of plants consist?
2. What is carbon?
3. What is hydrogen?
4. What is oxygen?
5. What is nitrogen?
6. Do all vegetable substances contain these four elementary bodies?
7. Name the more common substances which contain only these three elements.

SECOND LESSON.

III.—OF THE SUBSTANCES FOUND IN THE INORGANIC PARTS OF PLANTS.

1. The inorganic part of the plant contains from eight to ten different substances, namely, potash, soda, lime, magnesia, oxide of iron, oxide of manganese, silica, chlorine, sulphuric acid, or oil of vitriol, and phosphoric acid.

Here the teacher may exhibit to his pupils,—potash in the form of the common *pearl-ash* of the shops; soda, in that of the *common soda* of the shops; lime and magnesia, in the forms of *quick-lime* and *calcined magnesia;* oxide of iron in the form of *rust* of iron; silica, in the form of a piece of flint, rock, crystal, or quartz; a bottle of *chlorine gas*, one of sulphuric acid, (oil of vitriol,) and one containing a little phosphoric acid, or burnt bones, in which phosphoric acid is present. By placing these substances before the eyes of his pupils occasionally, and allowing them to look at, handle, and taste them, they will soon become familiar with their names, and with their several qualities.

2. The common potash of the shops is a white powder, which has a peculiar taste called an *alkaline* taste, and which becomes moist and at last runs to a liquid when exposed for a length of time to the air. It is obtained by washing wood ashes (the ashes left by wood when it is burned) with water, and afterwards boiling the liquid to dryness.

The teacher will here allow his pupils to taste the potash, that they may become familiar with the meaning of the word *alkaline* as applied to taste. (See page 550, note to Sulphuric Acid.)

3. The common soda of the shops is a glassy or crystallized substance, which has also an alkaline taste, but which, unlike potash, becomes dry and powdery by being exposed to the air. It is manufactured from sea salt.

The teacher will show a crystal of the common soda of the shops, and explain the meaning of the word *crystallized.*

The common potash and soda of the shops are called by chemists *carbonate* of potash and *carbonate* of soda respectively.

4. Lime or *quick*-lime is a white earthy substance, which is obtained by burning common limestone in the lime-kiln. It has a slightly burning taste, and becomes hot and *slakes* when water is poured upon it.

The teacher will exhibit a piece of quick-lime, will allow his pupils to taste it, and will pour water upon it, that it may fall to powder. They will thus become familiar with the word *slake.*

5. Magnesia is the white powder sold in the shops under the name of *calcined* magnesia. It has scarcely any taste, and is extracted from sea water and from those varieties of limestone rock called *magnesian* limestones.

6. Iron is a hard bluish-gray *metal*, which is manufactured in large quantities in our iron-works, and is used for a great variety of useful purposes.

The teacher will here explain the word *metal*, by showing that such common metals as iron, copper, lead, silver, and gold, have a lustre and weight not possessed by wood, stones, and other substances to which the name of metals is not applied, and that they can be beat out under the hammer, or are *malleable*.

7. When polished iron is exposed to the air, it gradually becomes covered with rust. This rust consists of the metal iron, and of the gas oxygen, which the iron has attracted from the air, and hence it is called an *oxide* of iron.

The teacher will explain more fully, that, when metals combine with oxygen, they form *new* substances, to which the name of oxides is given, and illustrate this by a reference to the *red oxide* of mercury, which, by the heat of the lamp, he had resolved or *decomposed* into oxygen gas and metallic mercury. (See note to Oxygen Gas.)

8. Oxide of manganese is a substance very like oxide of iron, which occurs in soils and plants usually in very small quantity.

9. Silica is the name given by chemists to the substance of flint, of rock crystal, of quartz, and of common sandstone.

10. Chlorine is a kind of air which has a greenish-yellow color, and a strong suffocating smell. A taper burns in it with a dull smoky flame. It exists in common salt in large quantity.

The teacher will exhibit a bottle of this gas, and may advert to the remarkable fact that this very noxious gas forms more than half the weight of the very wholesome substance, common salt—100 lbs. of common salt containing 60 lbs. of chlorine.

This gas is readily prepared by pouring muriatic acid on black oxide of manganese in a common flask, (fig. 5,) and applying a gentle heat. If the flask be of colorless glass, the smell and color of the gas and its effects on a burning taper may be shown, as in the case of oxygen in the flask itself in which the gas is prepared. Like oxygen also, it may be collected over water, which in this case should be warm, by fitting a bent tube into the mouth of the flask.

11. Sulphuric acid, or oil of vitriol, is a very sour, burning liquid, which becomes hot when mixed with water. It is manufactured from burning sulphur, (brimstone,) and it exists in common gypsum, (plaster of Paris,) in alum, and Glauber and Epsom salts.

The teacher will here exhibit the oil of vitriol, and show its *oily* character by pouring it from one vessel into another—that it becomes hot when mixed with cold water, and that a bit of straw when put into it is charred or *burned* black.

He will also explain the meaning of the term *acid* or *sour*. Besides being more or less sour to the taste, he may show that acid substances redden vegetable blue colors, such as decoctions of violets, of red cabbage, of a blue substance sold in the shops under the name of litmus; while alkaline substances, such as hartshorn, (ammonia,) common soda, pearl-ash, or quick-lime, restore the blue color again after an acid has reddened them.

12. Phosphoric acid is also a very sour substance, which is formed by burning phosphorus in the air. It exists in large quantity in the bones of animals.

Fig. 8.

If the teacher possess any phosphorus, he may here show how it burns with *white fumes* in the air, and may collect these white fumes—which are phosphoric acid—by holding over them a cold glass or metal plate, or he may simply burn the phosphorus in a little cup under a large glass, (fig. 8.) A still simpler way of making his pupils acquainted with phosphorus and phosphoric acid, is to take a common lucifer match, of the variety that kindles without explosion, and to rub the end of it on the sand-paper so gently as not to kindle it. If it be now brought near the nose, the smell of phosphorus will be perceived. If it be again rubbed so as to take fire, it will burn with a white flame, and will, for a short time, give a white smoke. *This white smoke is phosphoric acid.* A hundred pounds of phosphorus, when burned, form 227½ pounds of phosphoric acid.

13. The ashes of all our usually cultivated plants contain, in various proportions, all the substances just described.

14. Some plants have more ash than others. Thus 100 lbs. of hay may leave 9 or 10 lbs. of ash, while 100 lbs. of wheat leave less than 2 lbs. of ash.

15. These substances exist in different proportions in the ash of different plants; the ash of wheat, for example, contains more phosphoric acid than that of hay, while that of hay contains more lime than that of wheat.

QUESTIONS.

1. Of what substances does the inorganic part of the plant consist?
2. What is potash?
3. What is soda?
4. What is lime?
5. What is magnesia?
6. What is iron?
7. What is oxide of iron?
8. What is oxide of manganese?
9. What is silica?
10. What is chlorine?
11. What is sulphuric acid or oil of vitriol?
12. What is phosphoric acid?
13. Are all these substances to be found in the inorganic parts of plants?
14. Do all plants leave the same quantity of ash when burned?
15. Does the ash of different plants contain all these substances in the same proportion?

THIRD LESSON.

OF THE INORGANIC FOOD OF PLANTS.

1. All plants require constant supplies of food in order that they may live and grow.

2. Plants obtain their food partly from the air and partly from the soil.

3. Plants take in their food by their leaves from the air, and by their roots from the soil.

4. Plants require two kinds of food, organic food to support their organic part, and inorganic food to support their inorganic part.

5. The organic food of plants is obtained partly from the air and partly from the soil.

6. The inorganic food of plants is wholly obtained from the soil in which they grow.

Fig. 9.

7. The organic food of plants, taken from the air, is chiefly in the form of carbonic acid gas.

8. Carbonic acid gas is a kind of air which has no color, but has a peculiar smell. Burning bodies are extinguished by it, and animals die in it. It is heavier than common air, renders lime-water milky, and is taken up by its own bulk of cold water. It is the cause of the boiling up of soda water, and the frothing of beer, and forms nearly half the weight of all limestone rocks.

Here the teacher will prepare carbonic acid gas, by pouring dilute muriatic acid (spirit of salt) upon bits of limestone or of the common soda of the shops, in a tall covered goblet, (fig. 2,) or in a bottle, (fig. 11.) He will show that a burning taper is extinguished by this gas; but that it does not, like hydrogen, take fire itself; that it is so heavy that it may be poured from one

Fig. 10.

Fig. 11.

glass to another, (fig. 9;) that, when poured from a large tumbler glass, a common candle may be put out by it, (fig. 10;) and that when passed through clear lime-water, (fig. 11,) it makes it milky—forming *carbonate of lime.*

Lime-water is made by putting a little quick-lime into a bottle, filling up with water, shaking, and then allowing the whole to settle.

9. The proportion of carbonic acid gas in the composition of atmospheric air is very small, the latter being composed almost entirely of a mixture of oxygen and nitrogen gases. Five gallons of air contain about four of nitrogen and one of oxygen, but in 5000 gallons there are only two gallons of carbonic acid gas.

10. Plants drink in a very large quantity of carbonic acid gas from the air.

11. Plants spread out their broad thin leaves in great number through the air, and are thus able to suck in the carbonic acid from a large quantity of air at the same time.

12. This suction is performed by means of a great number of very small openings or mouths which are spread everywhere, especially over the under surface of the leaf.

13. The leaves take in the carbonic acid only in the day-time, at night they give it off.

14. Carbonic acid consists of carbon, or charcoal, and oxygen. Six lbs. of carbon and 16 lbs. of oxygen form 22 lbs. of carbonic acid.

15. The composition of carbonic acid gas is ascertained by burning charcoal in oxygen gas, when the carbonic acid gas will be formed.

The teacher will show this experiment by introducing a piece of red-hot charcoal into a bottle of oxygen gas, (or into a flask full of it, prepared as in fig. 5,) until the charcoal is extinguished, when, upon putting a lighted taper into the bottle, he will find carbonic acid has been formed, for the taper will be extinguished.

16. Plants retain the carbon only, and return the oxygen to the air.

Fig. 12.

17. By putting a few green leaves under a large glass full of fresh spring water, and setting them out in the sunshine, small bubbles of oxygen gas will be seen to rise from the leaves, and collect in the upper part of the glass, (fig. 12.)

It may be useful to the teacher to know that a *few* drops of sulphuric or muriatic acid will promote the production of these bubbles of oxygen gas. The oxygen is supposed to be derived from carbonic acid contained in the water; of which the leaf takes up the carbon, and sets free the oxygen. Hence, if pure boiled water be used, no oxygen will be separated by the leaves. But when bubbles have ceased to appear in spring water, in consequence of the carbonic acid being all decomposed, if a few drops of sulphuric acid be added, bubbles will again be given off, showing that they are not due altogether, or in all cases, to the presence of carbonic acid.

18. The leaves of plants also drink in watery vapor from the atmosphere.

19. The vapor absorbed by the plants serves to moisten the leaves and stems, and partly to form the substance of the plants themselves.

20. From the soil plants take in carbon in the form of carbonic acid, humic acid, and some other substances which exist in the black vegetable matter of the soil.

If the teacher wishes to form *humic acid*, he has only to dissolve a little common soda in water, to boil the solution upon finely powdered peat or rich dark soil, pour off the solution after it has stood to settle, and add weak spirit of salt to it. From it flakes will fall, which are humic acid. This humic acid consists of water and carbon only.

21. Plants derive nitrogen from the soil in the forms of ammonia and nitric acid.

QUESTIONS.

1. Do plants require food, as animals do?
2. Where do plants obtain their food?
3. How do plants take in their food?
4. Do plants require two distinct kinds of food?
5. Whence do they obtain their organic food?
6. Whence do they obtain their inorganic food?
7. In what form do plants take in their organic food from the air?
8. What is carbonic acid gas?
9. Does carbonic acid gas form a large part of the atmospheric air?
10. Do plants drink in much carbonic acid from the air?
11. How can plants drink in so large a quantity of this gas from the air if it contain so little?
12. How do they suck in the gas?
13. Do leaves suck in carbonic acid gas at all times?
14. What does carbonic acid consist of?
15. How do you prove the composition of carbonic acid?
16. Does the plant retain both the carbon and the oxygen contained in the carbonic acid that is absorbed by its leaves?
17. How do you show that the leaves give off the oxygen gas?
18. Do the leaves of plants drink in any thing else from the atmosphere?
19. What purpose does this vapor serve?
20. In what form do plants take in carbon from the soil?
21. In what forms do plants derive nitrogen from the soil?

In the preceding pages, we have commenced the publication of what is ultimately to be thrown together in a small volume, designed to make an "Agricultural School-Book," containing, however, much matter commendable to "children of a larger growth." After the establishment, in all countries, of schools for investigating and teaching the principles of Theology, of Medicine, of Law, and all that art and science can do to give greater efficacy to warlike operations, the world seems at last to be ready to tolerate the study of the various scientific facts and principles on which success in the great art of cultivating and preserving the productive powers of the earth, so essentially depends.

As far, then, as this slow but propitious direction of public sentiment may in any degree be encouraged by our humble means, we shall cheerfully apply them, and know not how we can better do so, for the present, than by placing *hand-books* on agriculture within the reach of every farmer's and planter's son, so cheap that all may possess, and so plain that all may comprehend them.

The Junior Editor of "The Plough, the Loom, and the Anvil,"—F. G. Skinner—has already, through the agency of Messrs. Carey & Hart, the publishers, offered one such work—"The Elements of Agriculture,"—translated from the French, and there published at the public expense, under the auspices of the Department for Public Instruction. It is hardly necessary to say that in this case, as in that, no pretension is made to original authorship: on the contrary, the strongest proof of the value of the work here presented is that this Catechism of Agricultural Chemistry is by James

F. W. Johnston, M. A., Chemist to the Agricultural Chemistry Society of Scotland, and has already passed through twenty editions in England, being here put forth only in a somewhat modified form, without alteration in any matter of substance, except by inserting some notices of nutritive substances not so much employed in England as in our own country. It was thought better, too, to follow the plan of the French work—"The Elements of Agriculture,"—by separating the questions from the matter to which they relate, and throwing them at the end of each lesson, so that the one and the other shall not be so immediately connected in the mind of the student as to make the whole rather an affair of simple memory than of real study and knowledge.

With this explanation, the work will be committed to the judgment of the reader, in the full persuasion that it may serve at least to awaken those who have at heart the character as well as the profits of agriculture, to the conviction that it too is a pursuit which calls for the exercise of intellect, and on which science may confer dignity as well as success.

RAILROAD IRON.

Most of the main lines of Railroads in this country have been engaged during the past year in re-laying their tracks with heavy rail. The following is given as the quantity of iron which has been contracted for in England, for this purpose:

	Tons.
Syracuse and Utica	2500
New York and New Haven	6000
Eastern	2000
Boston and Worcester	4000
Western	5000
Vermont Central	8000
Vermont and Massachusetts	4000
Rutland	8000
Old Colony	2000
Boston and Providence	1000
Stonington	1000
New Haven and Hartford	3000
Concord and Portsmouth	4000
Lawrence	2500
Boston and Lowell	1000
Utica and Schenectady	2000
Tonawanda	2000
Buffalo and Attica	4000
Ramapo	2000
Somerville	about 2000
Total number of tons,	66,000

Whatever amount of provisions, the products of the field, the orchard, the garden, and the dairy, was consumed by the operatives employed in digging and smelting the ore, and in manufacturing these 66,000 tons of iron, may be considered as that amount of such produce shipped from England to the United States. Under existing circumstances, probably not a dollar of such produce was made in the United States; for how, in ordinary times, can the cultivator of our soil compete with the slaves of European despots, who live on old black rye bread, called *pumpernicle?* Let us then abandon the *pumpernicle* policy, and let the farmer say that he who makes my iron must be a consumer of the produce of American ploughs. Have we not iron ore enough, and has not a Virginia member of the Legislature asserted that in that State there are 21,000 square miles underlaid with coal? Yet Virginia, to the last gasp, cries out "Free trade! Free trade!" which means vassalage to England and English looms and forges.

On Listening to Evil Reports.—The longer I live, the more I feel the importance of adhering to the rule which I have laid down for myself in relation to such matters:—"1. To hear as little as possible whatever is to the prejudice of others. 2. To believe nothing of the kind till I am absolutely forced to it. 3. Never to drink in the spirit of one who circulates an ill report. 4. Always to moderate, as far as I can, the unkindness which is expressed toward others. 5. Always to believe that, if the other side was heard, a very different account would be given of the matter."—*Carus's Life of Simeon.*

"THE PAST, THE PRESENT, AND THE FUTURE."

Of all benefactors, we look upon those as most entitled to our esteem, whose conversation and writings give us most food for agreeable and salutary intellectual digestion: and among works of this character, none performs that office better, in our humble judgment, than that of which the title stands at the head of these lines.

Political economy has been the chosen theme for men of the highest order of intellect, and yet for the most part they have, in the treatment of it, ended with making "confusion worse confounded." We say it with deference, and with an unaffected consciousness that the fault may, in our own case, be rather in the reader than the writer—yet we are apt, be it confessed, to conclude that when the writings of men of indisputable abilities, perplex instead of convincing, it is for the most part because the writer has not himself had a clear view of the *law* that belongs to his subject, and thus if he start on an erroneous principle, is himself dazzled in pursuit of an *ignis fatuus*, which he takes for a reality, and so bewilders without enlightening the reader who attempts to follow him.

The strong charm of Mr. Carey's book consists with us in his seeming to have first discovered the *law*—(for there is one which lies at the bottom of every question)—the natural, universal law, on which the politics of agriculture rest, and being satisfied of the truth of that, you can then, under all modification of circumstances, trace results with all the satisfaction and confidence with which a man proceeds even on ice when he *knows* he is treading on a safe foundation—and thus it is that political economy, hitherto forbidding from its abstruseness, or disgusting you with its contradictions, is made in these pages a captivating science. So strong is the natural relish for the truth in the mind of every candid inquirer, that all follow it with eagerness when they are sure they are on the right track.

Such, we confess, are the feelings which with us grow stronger on every recurrence to the pages of "The Past, the Present, and the Future." Another, and a powerful charm is, that the volume exhales throughout a spirit of benevolence, and inculcates a horror of war, as at once the seed and the fruit of tyranny and barbarism.*

That the work from which we have taken an entire chapter for this number has not been more prolific of commentary by our own Reviewers, we must ascribe, we suppose, to their higher powers of discrimination, and their juster appreciation of what better falls in with the popular taste. Nevertheless, it may be allowed us to find some satisfaction in the proofs we have seen, that however singular we may have been in offering our humble testimony to its rare merits, on the ground of original discovery, writers among the first in England and France have expressed a like opinion of its character and claims on the score of the originality and truth of its theory.

That we might not break the chapter, we have borrowed for it half the space usually assigned to the "Mother's Department," and if it had been placed there altogether, it would have been but another proof of the value we place upon that division of this journal, and of our desire on all occasions, to impress upon *her* the truth of the declaration that the Past does indeed say to woman—"If you would be a happy wife, mistress of your own home, and surrounded by your children, *love those who cultivate peace.*"

MAN AND HIS HELPMATE.

The savage derives his subsistence from the poorest soils. He roams abroad and shoots the deer: but leaves to his unhappy helpmate the task of carrying it home on her shoulders, and that of preparing it for his consumption. He helps himself, and when there is sufficient for both she may eat. When it is otherwise, she may starve. She is his slave, ever ready to prostitute herself to the stranger for a mouthful of food, a bead, or a nail.

* Voltaire thus expresses himself on the subject of war: "A hundred thousand mad animals, whose heads are covered with hats, advance to kill or to be killed by the like number of their fellow-mortals covered with turbans. By this strange procedure they want to know whether a tract of land to which none of them has any claim shall belong to a certain man whom they call Sultan, or to another whom they call Czar, neither of whom ever saw, or ever will see, the spot so furiously contended for; and very few of those creatures who thus mutually butcher each other, ever beheld the animal for whom they cut each other's throats! From time immemorial this has been the way of mankind almost all over the earth. What an excess of madness is this! and how deservedly might a Superior Being crush to atoms this earthly ball, the bloody nest of such ridiculous murderers!"

The man who cultivates the rich soils of the earth sees in woman the source of his greatest happiness. The companion of his hours of enjoyment, he turns instinctively to her for solace in the hours of affliction. He labors, that she may rest. He economizes, that she may enjoy the comforts and luxuries of life: while she regards him as the chosen partner of her existence, and the father of her children; and, as such, entitled to exclusive possession of her affections.

If we trace the history of woman in Athens we may see the gradual decline of her influence as incessant wars brought poverty and depopulation, and as the cultivation of the fertile soils was more and more abandoned, until we meet, on the one hand, the *Hetæræ*, constituting an important element of society: and, on the other, the female slave, engaged in the severest labors, and not unfrequently perishing for want of food: while abroad, women and children are involved with husbands and fathers in the atrocious punishments that follow resistance to the orders of a rapacious military aristocracy, eager to divide among themselves the plunder of subject cities.

If we look to Rome in the prosperous days when the fertile lands of Latium, cultivated by their free owners, gave food to numerous cities, we may see woman respected, and respecting herself. If we seek her in the days when population had declined, and cultivation had been abandoned to slaves, and when Italy had ceased to afford food for her greatly diminished numbers, we find her type in Messalina and Agrippina, Poppœa and Faustina.

In modern Italy, with the decay of population and of wealth, we see thousands of women, who have witnessed the massacre of their husbands and their sons, driven abroad to perish of starvation, or subjected to the last outrages by hordes of wandering barbarians, Franks or Germans, while in Lucrece Borgia, or Beatrice Cenci, we find the type of woman in the higher ranks of life. In the poorest parts of Italy, those in which land is least divided, may now be found the wealthiest women: while the wife of the poor serf slaves in the field to obtain a small allowance of the poorest food. Increasing inequality of condition and increasing crime are thus the invariable attendants of poverty and the abandonment of the fertile soils of the earth. If we desire other evidences of this, we may turn to France in the terrific days of the Merovingians.: and there we find the sex a slave to the worst passions of men, the subjects of female barbarians occupying thrones, who are known to history by the names of Fredegonda and Brunechild: women almost unmatched for crime.

Exhausted by wars of conquest under Charlemagne, we find France a prey to invasion from every side, by barbarians who respected neither age nor sex. The cultivation of the land was abandoned, and the people who escaped the sword perished of starvation. Poverty and depopulation gave birth to the barbarism of the feudal system, for which the world stands her debtor. With each step in its progress men were forced to resort to poorer soils: and with each we see the poorer freeman gradually losing control over his actions, and becoming daily more and more the slave of his lord. With each, we see the honor of his wife and daughter becoming less and less secure, until at length we find the *droit de jambage et de cuissage* universally asserted, and so generally exercised that the eldest born of the tenant is held more honorable than the others: it being probable that it was the child of the lord. Concubinage becomes universal, and bastardy ceases to cause any feeling of disgrace. Dissolute queens provide mistresses for their husbands, while princes, styled "the good," or "great," number their concubines by dozens, and *bâtards* and *grand bâtards* fill the high offices

of state, and monopolize the great dignities of the church: or distinguish themselves as *ecorcheurs*, or flayers of the unfortunate peasant, whose wife perishes of starvation while they accumulate vast fortunes and take rank among the good and great. Later queens find in the easy virtue of their maids of honor, security for the adhesion of their partisans: and *gentlemen* find in rape one of the inducements to the invasion of the unfortunate lands of Italy or Spain, Germany or the Netherlands. Cities and towns are sacked, and nobles and gentlemen gorge themselves with plunder, while women and children ask in vain for food. Titled prostitutes next direct the affairs of state, and women suffer at the stake for errors of opinion: while wives and daughters of the poor serfs labor in the field, seeking in vain from the miserable soils they cultivate the means of supporting life. Unceasing wars and universal poverty are accompanied by excessive inequality, and by the dissoluteness of manners that invariably attends the absence of all control on the part of the *many*, and the consciousness of the possession of unlimited power on the part of the *few*. Duchesses now publish to the world the histories of their amours, and princesses of the blood are honored by the notice of Montespans. Queens and kept mistresses are *compagnons du voyage*, and *Brinvilliers* furnishes poisons to enable amorous wives to change their husbands. Thus, by degrees, we reach the period when incest ceases to be a crime, and the representative of majesty takes his mistresses indifferently from among the daughters of others, or his own. The *parc aux cerfs*, or royal academy for prostitutes, maintained at the cost of millions collected by taxes on salt and all other of the necessaries of life, next occupies the time and mind of the sovereign: while a *du Barri* holds the helm of state. Arriving at the period of the Revolution, we see *poissardes* heading insurrections, while queens, princesses, and duchesses, are dragged to prison, preparatory to being made to feel the weight of the revolutionary axe; and indiscriminate murder: *noyades* and *fusillades:* sweeps off by thousands miserable men, whose wives and daughters, reduced perhaps from affluence, are forced to beg their bread from door to door, or seek a refuge from starvation in the horrors of public prostitution.

In nothing is the brutalizing effect of perpetual war more fully exhibited than in the total want of respect for female life or honor, that is shown in every portion of the history of France. The "*bons bouchers*" of Charles the Bold spare neither women nor children. The *Bourguignons* and *Armagnacs* spare none. The Turkish allies of France sweep off the women and children of Italy by thousands into captivity. On the other hand, Diana of Poictiers is more conspicuous in history than her royal and more youthful lover: and the head of the house of Bourbon is rarely mentioned but in company with his mistress, *la belle Gabrielle:* while thousands feel for the sorrows of the unhappy La Fayette, who would find it difficult to bestow a thought upon the unfortunate women of Milan, Mantua, or Naples, Ghent, or Bruges, whose husbands and sons are mowed down by thousands, while they themselves are made to endure the last indignities to which their sex is liable, and their daughters are forced to seek in prostitution the means of obtaining food. The history of that unfortunate country is one of perpetual poverty, and a record of total inability to resort for support to any but the poor soils: and the man who derives his subsistence from those soils is always a barbarian: and not the less so because he chances to wear a cocked hat and feathers. Extreme inequality in the condition of the different portions of the female sex, is one of the characteristics of barbarism: and in every portion of the history of France is exhibited the same inequality that is now shown in the poor girl who, unable to purchase fuel, sleeps in the day and works by night in the stable that she may derive from the proximity of animals

a supply of heat, on the one hand, and the vast fortune of the *Duchesse de Praslin*, on the other.*

If we look at the condition of the sex in the present day, we see the results of perpetual war, in the fact that women still labor in the field: in the aversion to marriage on the part of the men: and in the absolute necessity for the *dot*. An unportioned woman has no chance of marriage: while those who have portions see their husbands but for a moment, before forming a connection that is intended to last for life. *Marriages de convenance* are universal, and frequent adultery is the necessary consequence: while tens of thousands of women see no immorality in the formation of temporary unions. Foundling hospitals enable them to dispose of their offspring, to perish by hundreds in the hands of hireling nurses paid out of the proceeds of taxes imposed upon the honest and virtuous laborer, whose unremitted exertions are insufficient to enable him to procure a miserable subsistence for his wife and his children: and who lives on, a creature without hope, while mistresses and female stock-gamblers, titled and untitled, have boxes at the opera, and sport their gay equipages on the day of *Longchamps*: while queens and princesses have palaces that count almost by dozens, and young ladies, just married and become *enceinte*, publish the fact throughout the kingdom, to be received as cause for rejoicing by the poor man who sees his wife or daughter dying for want of food. Under such circumstances, it is not extraordinary that in meeting three young Parisians we should have reason to feel assured of the middle one being a bastard: that being the proportion of illegitimate to legitimate births.

In England the position of the sex has been widely different. More than any other portion of Europe has the soil of that country been exempt from the horrors of war, the effect of which is seen in the fact that the cottage of the laborer figures in every portion of the English landscape, affording the strongest evidence of the long existence of internal peace. The husbandman has been there exempt from the necessity of seeking protection within the walls of the town. There he has, more than in almost any part of Europe, been enabled to economize the machinery of exchange by living on the land that he cultivated, and thus has saved the cost of transporting himself to his work, and that of transporting the products of his labor to his place of residence: and, still more important, he has had a place upon which he might bestow those hours and half hours that in France are necessarily wasted. He has had A HOME of his own, and having the thing, he has made the word to express the idea.

In no part of Europe has the feeling of perfect individuality existed to the same extent as in England, and that it has there existed has been due to the fact that there, more than elsewhere, has internal peace existed, permitting man to place himself on the spot upon which his labors were to be applied. The home of the individual man required a mistress, and the choice of the man was influenced, necessarily, by the fact that she was to be his companion in his home, distant perhaps from the homes of other men, and that he was to be *dependent* upon her kindness and affection for the happiness of his life, and for the care of his children. Peace and the growth of wealth tended therefore to give to the weak woman power over the strong man: whereas war has, in all ages, tended to render her his victim.

With each step in the progress of wealth and population, we may see an improvement in the condition of woman, from the day when powerful barons

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* "The *trousseau* of Mademoiselle Martignon, who is going to marry the Baron de Montmorenci, is to cost a hundred thousand crowns ($110,000). There are to be a hundred dozen of chemises; and so on, in proportion."—*French Newspaper.*

contested the rights of the heiress of Henry I., and the poor Saxon neif was sold to slavery in Ireland; and that when the daughter of Torquil Wolfganger presided over the revels of Front de Bœuf; to those in which the throne was filled by the masculine Elizabeth: but with the following century came a long period of internal war and waste, to be followed by one of extreme demoralization; that of the reigns of Nell Gwynn and the Duchesses of Portsmouth and Cleveland. Royal and noble bastards then abounded. From the Revolution of 1688, until we approach the close of the last century, wealth and population gradually increased, and the people were better fed, better clothed, and better lodged than in any former period: the effect of which may be seen in the improved condition of the sex. Many of the abominations which marked the early years of the century had passed away before the commencement of the great war. Kings ceased to have mistresses to aid in the management of the affairs of state, and fleet marriages became less common. With that war and its enormous waste we find, however, a new state of things. The *few* now become immensely rich, while the *many* become poor. The price of corn rises, and that of man falls. Landholders become too great to manage their own affairs, and they must have great tenants, with great farms. Cottages disappear, and almshouses become filled. Labor ceases to yield food, and women seek to have bastards that they may obtain allowances, ***and thereby obtain husbands.*** Indiscriminate intercourse becomes so common as in some degree to arrest the growth of population;* while thousands of children perish of neglect and want of food. Great club-houses, and houses of prostitution increase in a ratio corresponding to each other, and thus we find that each step in the progress of war and waste: necessarily accompanied with growing inequality: is attended with a deterioration of the condition of the sex.

With the long continued peace and the consequent growth of wealth, there has been a gradual improvement in the condition of the sex, in England, but *bondagers*, *i. e.* female field-laborers, still figure in the leases of Northumbrian landholders; half-starved women are yet conspicuous among the habitués of gin-shops: sales of wives with halters round their necks have not yet disappeared: women and girls still labor in coal mines, and sometimes in a state of perfect nudity: and adultery is not unfrequently the consequence of marriages in which property and not inclination is consulted. A state of society in which exists inequality to the extent to which it is found in England, is not favorable to female honor. Heavy taxes tend to produce poverty, and mischievous regulations bar men from finding employment, and hence marriage is far less universal than it ought to be. Taxes and regulations tend to produce a large class with money to spend and with no employment for time, and hence a disposition for gallantry that would not otherwise exist. The steady and regular application of time or talent is the best security for morals, and that is invariably seen most to exist where labor yields the largest reward. All men would marry, if all could do so with safety to themselves. In such a state of things, the exceptions are only sufficient to prove the rule. The universal possession of property is the best guarantee for the security of property, and the universal possession of wives and families is the best security for morals; for husbands and fathers are interested in the repression of every thing tending to promote immorality.

In Scotland, improvement would appear to be less certain. There, entails

* It was stated twelve or fifteen years since by a clergyman: we think the Rev. Mr. Cunningham: that the morals of his parish were improving; and the reason given for this belief was, that bastards had become more numerous, from which fact he inferred that indiscriminate intercourse had become less common.

increase in number. There, sheep have taken the place of men whose cottages have been burned, and who have been compelled to seek refuge within towns and cities: and with their homes the sex has been compelled to lose the pride of female honor. Glasgow presents a scene of wretchedness rarely equalled among civilized men, and houses of prostitution exist in the ratio of one to twenty-eight! Such are the results of the increasing power of land, and diminishing power of man.

Perpetual peace abroad and at home has given to the United States constantly increasing wealth, and every man has been thereby enabled to feel that he might marry without hesitation. All, therefore, do marry; and hence the rapid increase of population: and hence the general morality. Bastardy is rare. If we seek to find it, it must be among the people who cultivate the poorer soils. Thirty years since, it abounded among the Germans of Pennsylvania, who raised small crops from the heavy clay; and then women labored in the fields: but it has gradually diminished as population and wealth have grown, and as they have been enabled to combine the inferior lime with the superior clay, and have thus obtained a better soil. Receding gradually, it may yet be found in the counties more distant from the city, where a scattered population still obtain small crops from poor soils. It may be found in all those counties in which poor farmers sell all their hay, and buy no lime. In general, however, it exists to a very small extent; and the sex, respecting themselves in a higher degree, are respected, in a degree unknown to other portions of the globe. Dowry is rarely thought of.* *Marriages de convenance* scarcely exist. The marriage tie is held sacred,† and all because each man has, or can have, his own home, within which he is sole master, except so far as he defers its management to its mistress, whose control within doors is most complete; but there she stops.‡ Everywhere is manifested towards the sex: old and young: rich and poor: high and low: a degree of deference elsewhere unthought of.§ They travel unprotected for thousands of miles, fearing no intrusion, and encountering none of those discomforts to which they are exposed in every part of Europe.‖ With marriage, the task of providing for the family is assumed by the husband; and woman then is left to the performance of

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* "We buy our wives with our fortunes, or we sell ourselves to them for their dowries. The American chooses her, or rather offers himself to her for her beauty, her intelligence, and the qualities of her heart; it is the only dowry which he seeks. Thus, while we make of that which is most sacred a matter of business, these traders affect a delicacy, and an elevation of sentiment, which would have done honor to the most perfect models of chivalry."—*Chevalier.*

† "You may estimate the morality of any population, when you have ascertained that of the women; and one cannot contemplate American society without admiration for the respect which there encircles the tie of marriage. The same sentiment existed to a like degree among no nations of antiquity; and the existing societies of Europe, in their corruption, have not even a conception of such purity of morals.—*M. de Beaumont.*

"The marriage tie is more sacred among American *workmen* than among the *middle classes* of various countries of Europe."—*Chevalier.*

‡ "Not only does the American mechanic and farmer relieve, as much as possible, his wife from all severe labor, all disagreeable employments, but there is also, in relation to them, and to women in general, a disposition to oblige, that is unknown among us, even in men who pique themselves upon cultivation of mind and literary education."—*Chevalier.*

§ "One of the first peculiarities that must strike a foreigner in the United States is the deference paid universally to the sex, without regard to rank or station."—*Lyell.*

‖ "We have allowed the administration of the customs to adopt practices unworthy of a civilized nation. It is inexplicable that they should have imposed upon the French, who believe themselves the most polished nation of the earth, rules, in virtue of which their wives and daughters are personally examined and felt, in filthy holes and corners, by female furies. These scandalous brutalities of the agents of the treasury are inexcusable, for they produce nothing to the revenue."—*Chevalier.*

the duties of the household, and the care of her children: and everywhere the labor incident to the performance of those duties is lightened by improved machinery.* In no part of the Union, however, is she seen to the same advantage as in Massachusetts, where man derives from the cultivation of a naturally sterile soil returns to labor unknown to those who cultivate the prairies of the West: and where may be seen, congregating in thousands, female operatives among whom bastardy is unknown. The greatest of all the moral phenomena of the world is to be found in the city of Lowell, and the enlightened traveller will find in its examination abundant compensation for a failure of his visit to Niagara.†

With each step in our progress south, men cultivate poorer soils, and the power of combination diminishes; and with each such step the value of female labor, and the power of woman to provide for and defend herself, diminish, until we find her and her children becoming the property of another. That all may become free, and that woman everywhere may acquire power over her own actions, determining for herself who she will marry and who she will not; that she may everywhere obtain a home in which to devote herself to the performance of those duties for which she was intended, the happy wife becoming the mother of children educated to be useful to themselves, their parents, and society: it is essential that wealth should be permitted to increase. It does increase most rapidly where men cultivate the most fertile soils; and that those soils may be cultivated, combination of action is indispensable. The consumer *must* take his place by the side of the producer. With each step of increase in the density of population, the power of combination increases, the consumer and the producer being enabled more and more to place themselves by the side of each other. Population and wealth increase most rapidly where women are most chaste, and where they are most chaste they are most valued: whereas, where neither population nor wealth is permitted to increase, woman is, and must ever be, a slave and a prostitute; and man a barbarian, cultivating the poorest soils.

The PAST says to the sovereign of the PRESENT: "If you desire that woman should occupy the position for which she was intended by her Creator, cultivate peace."

To the landlord it says: "If you desire that your lands shall become valuable, avoid war, and permit wealth to increase, that woman may be chaste and population grow."

To the laborer it says: "If you desire that the honor of your wife and daughter be respected, labor to promote the maintenance of peace."

To woman it says: "If you would be a happy wife, mistress of your own home, and surrounded by your children, love those who cultivate peace."

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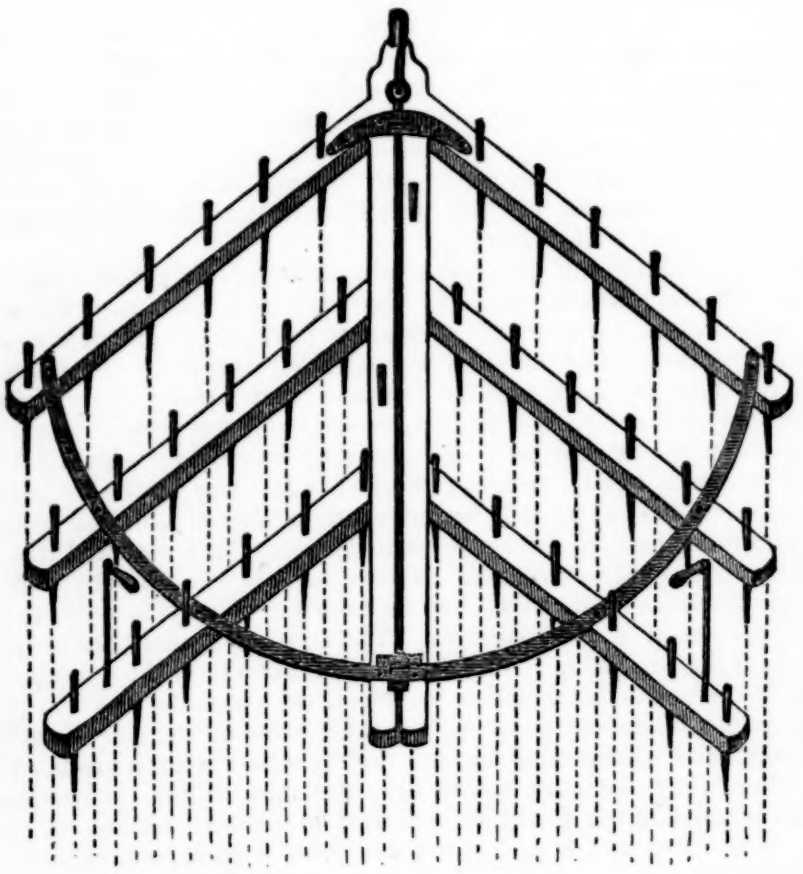
* "The inventive spirit of the people of New England, and of their descendants throughout the Union, is displayed in the production of machinery for economizing the time and labor of their wives."—*Chevalier.*

† "The factories at Lowell are not only on a great scale, but have been so managed as to yield high profits, a fact which should be impressed on the mind of every foreigner who visits them, lest after admiring the gentility of manner and address of the women, he should go away with the idea that he had been seeing a model mill, or a set of gentlemen and ladies playing at a factory for their amusement."—*Lyell.*

"Morning and evening, and at meal times, seeing them passing in the streets, well dressed, and again, seeing suspended on the walls of the factories, among the vases of flowers, and the shrubs which they cultivate, their scarfs, and their shawls, and the hoods of green silk with which they envelope their heads, to secure them from the heat and dust in walking, I said to myself, This is not Manchester."—*Chevalier.*



IMPROVED HARROW.

Mount Airy, December 31, 1848.

MESSRS. EDITORS,—I hereby submit the following drawing and description of a harrow recently improved and constructed under my direction, for the use of the *Mount Airy Agricultural Institute Farm.* This harrow is constructed somewhat after the plan of the Geddes harrow, differing from it in the following particulars:—The teeth are inserted into three timbers instead of two in each half: the number of teeth are increased in the same ratio: the angle formed by the side pieces meeting the centre ones is much more obtuse than in Mr. Geddes's harrow, being 52°. It also has handles attached, which, with the teeth, are made of round iron. The claimed advantage of the additional side-timber is, that it admits of an addition of one-third to the number of teeth in the implement, without placing them so near as to cause them to clogg with rubbish, which naturally accumulates between them. By increasing the angle formed by the junction of the side and centre timbers, greater width is obtained in the implement with the same material, by which the same team will perform one-third more work in a given time. By the aid of the handles, the harrow may be relieved of any obstruction gathering between the teeth with much greater ease and facility. By attaching the draught-hook on the top of the frame, and opposite the two front timbers, the tendency of the harrow to draw up in front is effectually remedied. I consider the round teeth preferable to the square ones, for these reasons, viz.: they are less liable to clog, as they present no flat surface, and can be fitted into the timber with much less difficulty

and expense, and are also much less liable to split the timber when indiscreetly driven, all danger of which is avoided in the use of the round teeth, by driving them with a thin strip of leather on one side of the tooth, so placed as to cause the greatest stress longitudinally of the timber. The timbers are all of one size, being 3 inches wide by 2½ deep. The frame should be made of good oak: if white oak cannot be procured, red elm may be used with economy: in the absence of both, white ash may be used. The centre timbers are six feet long; the front side pieces are four feet; the middle side pieces are three feet nine inches; and the rear side pieces are three feet six inches in length. The teeth are so arranged that by once passing over the ground the whole surface is moved and pulverized. They run one and three-fourth inches apart from centre to centre. The teeth are made of inch round iron, eleven inches long, extending five and one-half inches below the timber, and are thirty-eight in number. The handles are made of ⅝ round iron, with a deep thread cut on the lower end, and screwed into the rear side pieces between the first and second teeth, as shown in the figure. They are bent at a right angle eighteen inches above the timber, on which is placed a wooden handle. The braces are of wrought iron, curved, as represented in the drawing, being secured to the timbers by half-inch iron bolts. The braces also serve as hinges, the draught-rod passing through them both, with a nut upon the rear ends. The convenience and utility of the handles will be obvious to all who have had experience with the use of this implement:—its triangular shape, with joint in the centre, renders it more convenient than any other arrangement for stony and stumpy grounds.

Most respectfully, your obedient servant, DENNIS JOHNSON,
Pupil Mount Airy Institute.

It would have been well to have given the *weight* of these harrows. To us they *look* rather heavy. The price is stated to be $15.

THORNAGE AGRICULTURAL STEAM COMPANY.

IN the year 1847, a number of gentlemen in the neighborhood of Thornage formed themselves into a company, under the above title, for applying steam-power to the threshing of corn, and for other purposes. On Monday last the first annual meeting was held to receive the report of the superintendent as to the working of the engine under his charge. The accounts, after deducting all expenses, showed a return of nearly twenty per cent., and the shareholders agreed to accept a dividend of ten per cent., and to form a fund with the surplus to meet contingencies. It is highly gratifying to those concerned in the enterprise, as well as to the public generally, to find, that this first attempt at introducing steam-power for agricultural purposes, into a vicinity where its benefits were not previously appreciated, has been attended with so much success. Lord Hastings, Mr. F. Astley, Mr. Sparham, Messrs. Boyd, Mr. J. Page, Mr. H. Burrell, Mr. Sheringham, Mr. Woodcock, and other eminent agriculturists, are shareholders of the company. It is only right to add, that it was owing to the indefatigable exertions of Mr. H. Burrell that this great agricultural benefit has been obtained.—*Norfolk Chronicle.*

For Ridding Gravel Walks of Grass.—I have found the following plan very effectual:—I have a water-tight chest on wheels, holding about 50 gallons; a large bucketful of salt is put into the box, and it is filled up three parts with boiling water, wheeled into the garden, and applied hot from a watering-can with a rose, giving a liberal dose; 24 hours will tell a tale. H.

[Yes; but what happens the next year, or the year after? Are not the weeds stronger than ever?]

PENNSYLVANIA ANTHRACITE COAL TRADE.

We are not without apprehension that the retired farmer, exclusively engaged in practical agriculture, and anxious only to augment his income by the increase of his crops, and his flocks and herds, will be apt to exclaim at the sight of the following tables—How do these statistics concern us, and had you not in lieu of them better give us what is commonly and properly called *practical matter?* But is it not proper that every gentleman in the country should be possessed of these condensed views of the progress and condition of great branches of national industry, the prosperity and the decline of which are so obviously and intimately connected with that of agriculture? Let the farmer remember that every bushel of coal, from the moment that the pick is struck into the mine, until it travels to the furnace and the factory, and until it is there converted into iron or cloth, begins and continues throughout the whole process, to consume and to represent *so much of the products of the plough!*—and that when coal, delved in our own mines, is substituted by that which comes from other countries, the coal heavers of these other countries consume the products of the ploughs of the poorest, the most enslaved, and the most degraded people on earth; while those who, in our own country, are thus driven from the coal mines, must either suffer for want of employment, or go back for relief to the West, and on cheap lands become *rival* producers of corn, wheat, and wool. The same we have proved to be the case where imported iron takes the place of our own. It is not, reader, that we feel called upon to plead the cause of the manufacturer, from any particular affection for, or anxiety about him, *per se*, but that we regard his presence, and his prosperity, as indispensable to the well-doing of the farmer and the planter. As for the fantasy of *free trade*, it may do well enough to amuse philosophers and closet politicians; but is not adapted to *the world as it is*—and if we would live in the world, we must live with the world. If ever there was a country under the sun, that could depend on, and that ought to develope its own resources, ours is that country: for while other nations are defective either in territorial limits or in climate, for the production of *many things essential* to national independence, what is it that we do not possess both the soil and the climate to produce?—coffee, perhaps, excepted, and that by no means an essential, though custom has made it comfortable to enjoy it. Is there *any species* of provisions that we cannot raise for ourselves?—any mineral or material for manufacture that we have not in abundance—iron—coal—timber—water-power—salt—sugar—wool—cotton—ample capacity and resources for wine, oil, silk, and even tea! Is not our situation, then, *essentially different* from that of *all* other nations, and ought not our policy to differ accordingly? As for England and her eternal cry of "free trade," about which she has ever kept the word of promise only to the ear, her whole course of legislation has been to make that little island the workshop of the world. Make commerce free, and England would be ruined—her capital would take wings and come to where the food and the materials for manufacture are cheapest, and then we, exempt from her enormous load of public debt and taxation, would succeed to her vast manufacturing and commercial power. Then we should have real, not bastard free trade; and that is what *we* are looking to. Can any proposition be plainer, than that it is the interest of the agriculturist to give all the encouragement he can to the manufacturers; for the more they flourish, the more able they will be to repay the planter and the farmer for their produce! And yet, for endeavoring in every form, as we shall continue to do, to illustrate the truth of this, we sometimes get (almost all of them, but not

many in the aggregate, from *Virginia*) letters, withdrawing subscriptions—of which we have no right, and do not pretend to complain.

From the Philadelphia Commercial List.

In accordance with our usual custom at the commencement of the new year, we present our subscribers with a Statement of the ANTHRACITE COAL TRADE for the past year. We have also prepared several tabular statements, showing the amount of coal sent to market annually, from the different coal regions, from the commencement of the trade in 1820, to the present period.

Having been employed to prepare a tabular statement of this trade for the purpose of being engraved on the new Map of Pennsylvania, we have carefully examined the records kept by the various companies, of the supplies forwarded by the different canals and railroads, in order to insure entire accuracy. It will be seen that some slight errors have been discovered and corrected, in our former statements, and we now present our tables as embracing the official returns of this trade, from its commencement to the present period.

The vast importance of the coal trade can readily be understood by referring to these tables, which show its astonishingly rapid increase. Only twenty-eight years since, and the total supply of coal sent to market was 365 tons, now it exceeds 3,100,000 tons, even in a year of great depression in various branches of manufactures, particularly iron, in the make of which a large quantity of coal is consumed.

Previous to 1820, the use of Anthracite Coal was unknown as fuel in this country, and it was considered an article of doubtful combustion; in fact, some of the early pioneers, in their endeavors to bring it into use, were treated as impostors. Now it is used extensively as fuel along our extended seaboard, from Maine to Louisiana, as well as in the interior.

The three principal coal fields of Pennsylvania are each about sixty-four miles in length by five miles in breadth, embracing an area of 325 square miles, or 208,000 acres each—forming an aggregate of 975 square miles, or 624,000 acres.

When we consider that Pennsylvania is the only State in the Union which possesses Anthracite Coal in any quantity, we may be permitted to ask, what would be the condition of her sister States, if she were suddenly annihilated, with her mountains of coal and iron? How melancholy would their condition be in regard to these indispensable requisites of civilized life, without which no nation can really be independent!

This trade gives employment to a vast number of persons in various ways. It has caused the construction of some of the best canals and railroads not only in the State, but in the world. It furnishes employment to laborers, in digging the canals and making the railroads; to mechanics and artisans, in constructing cars, and locomotives, and boats; besides the iron used for rails, as well as other materials. In the ground, coal is worth only 30 to 40 cents per ton—all the other expenses in procuring it are paid for labor. It furnishes employment to miners, boatmen on the canals, brakemen and laborers on the railroads, carters and others employed in its delivery, besides the large number of seamen engaged on board of vessels employed in transporting it to various places on the seaboard. In fact, the coal trade furnishes the best nursery for seamen in the United States, if we except the whale fisheries, and it is soon destined to exceed that important trade, which has hitherto prepared the best seamen in the world. In case of any sudden emergency in defending our extended seaboard, we should have a large body of active, bold, and intelligent men, trained for our public service and ready for any emergency.

The coal trade has more than trebled the coasting-trade of Philadelphia within twenty-five years. In 1822 there were cleared from this port 4 vessels, carrying 181 tons of coal; in 1825, 11 vessels, carrying 1123 tons; in 1840, 644 vessels, carrying 63,137 tons. In 1847, the total number of clearances from Richmond alone, comprised 2 ships, 36 barks, 661 brigs, 4771 schooners, 774 sloops, and 5200 boats and barges—total, 11,444 vessels, carrying 964,521 tons of coal.

In the construction of the various canals and railroads leading to the coal mines, upwards of FORTY-FIVE MILLIONS OF DOLLARS have been expended. But who will pretend to calculate the enhanced value of the land, where once the panther and the bear roamed!—the desert has been made to bud and blossom as the rose, and smiling villages and populous towns have sprung into existence as if by magic.

With such facts before us, and the importance of the coal trade to the Union, is it not surprising that our government has not afforded ample protection and encouragement to this trade? What operations can be more entitled to protection in a national point of view? We confess we cannot conceive any.

The following table shows the quantity of coal brought from each coal field, annually, from the commencement of the trade to the 1st of January, 1849:—

THE ANTHRACITE COAL TRADE.

TABLE *showing the quantity of Coal sent to Market annually, from its commencement, in* 1820, *to* 1848, *inclusive.*

PREPARED FROM OFFICIAL DOCUMENTS.

Years.	Total Lehigh. TONS.	Total Schuylkill. TONS.	Total Lackawanna. TONS.	Total Pine Grove. TONS.	Total Lykens Valley. TONS.	Total Shamokin. TONS.	Total Wyoming. TONS.	Total Supply. TONS.	Increase and Decrease. TONS.
1820	365	- -	- -	- -	- -	- -	- -	365	- -
1821	1,073	- -	- -	- -	- -	- -	- -	1,073	708 I.
1822	2,441	- -	- -	- -	- -	- -	- -	2,440	1,167 I.
1823	5,823	- -	- -	- -	- -	- -	- -	5,823	3,583 I.
1824	9,541	- -	- -	- -	- -	- -	- -	9,541	3,718 I.
1825	28,396	6,500	- -	- -	- -	- -	- -	34,896	25,355 I.
1826	31,280	16,767	- -	- -	- -	- -	- -	48,047	13,151 I.
1827	32,074	31,360	- -	- -	- -	- -	- -	63,434	15,387 I.
1828	30,232	47,284	- -	- -	- -	- -	- -	77,516	14,082 I.
1829	25,110	79,973	7,000	- -	- -	- -	- -	112,083	35,567 I.
1830	41,750	89,984	42,700	- -	- -	- -	- -	174,734	62,351 I.
1831	40,966	81,854	54,000	- -	- -	- -	- -	176,820	2,386 I.
1832	75,000	209,271	84,500	- -	- -	- -	- -	368,771	191,951 I.
1833	123,000	252,971	111,777	- -	- -	- -	- -	487,748	118,977 I.
1834	106,244	226,692	43,700	- -	- -	- -	- -	376,636	72,112 D.
1835	131,250	339,508	98,845	5,500	- -	- -	- -	575,103	198,467 I.
1836	146,522	432,045	104,500	9,978	5,439	- -	- -	698,484	123,381 I.
1837	225,937	523,152	115,387	16,726	6,430	- -	- -	887,632	189,148 I.
1838	214,211	433,875	76,321	16,665	6,005	4,104	- -	746,181	141,451 D
1839	222,042	442,608	122,300	19,227	5,372	11,930	- -	823,479	77,298 I.
1840	225,591	452,291	148,470	19,463	5,302	15,928	- -	867,045	43,566 I.
1841	*142,807	†585,542	192,270	15,306	6,176	22,154	- -	964,255	97,210 I.
1842	271,913	541,504	205,253	31,437	181	10,098	47,346	1,107,732	143,477 I.
1843	267,125	677,313	227,605	22,879	- -	9,870	57,740	1,262,532	154,800 I.
1844	376,363	840,379	251,005	27,719	- -	13,087	114,906	1,623,459	360,927 I.
1845	430,993	1,086,068	266,072	31,208	- -	10,135	178,401	2,002,877	379,418 I.
1846	522,518	1,236,581	318,400	55,346	- -	12,646	188,003	2,333,494	330,617 I.
1847	643,508	1,572,794	388,200	61,233	- -	14,904	289,898	2,970,597	637,103 I.
1848	680,193	- -	434,267	56,938	2,000	- -	- -	- -	- -

From the above statement it will be seen that the total quantity of coal sent to market from the commencement of the trade, has been 22,000,000 tons. Of this quantity the Schuylkill region has furnished 11,859,150 tons; the Lehigh, 5,050,327 tons; the Lackawanna, 3,392,572 tons.

The business in the Lehigh region is carried on chiefly by incorporated companies.

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* Great Freshet which injured the canal.

† Of the coal brought from the Schuylkill mines, the following quantities have been brought down on the Reading Railroad, the balance of course has been received by the Schuylkill Canal:—

	Tons		Tons.		Tons.		Tons.
1841	850.00	1843	239,255.00	1845	822,481.04	1847	1,350,151.10
1842	49,902.00	1844	241,492.10	1846	1,233,141.10	1848	1,216,232.03

The total supplies sent from the Schuylkill, on the railroad and canal, in 1848, have been:—

	By Railroad, Tons.	By Canal, Tons.	Total supply in 1848.
Port Carbon	372,509.05	257,706.19	- - - - -
Pottsville	199,990.07	34,971.01	- - - - -
Schuylkill Haven	501,560.10	125,409.13	- - - - -
Port Clinton	142,172.01	18,514.09	- - - - -
Total	1,216,232.03	436,602.02	1,652,834.05

The following table shows the quantity of coal forwarded by each company and by individuals, from this region, annually :—

LEHIGH COAL TRADE.

The total quantity of Coal shipped from the Lehigh Coal Mines, annually, from the commencement of the trade, in 1820, *to* 1848, *inclusive, has been as follows:*

Years	Lehigh Coal Company. TONS.	Beaver Meadow Company. TONS.	Hazleton Company. TONS.	S. Loaf, now Diamond. TONS.	Buck Mount'n Comp'y. TONS.	Summit. Spring Moun'n. TONS.	Wilkesbarre R. R. TONS.	Cranberry. TONS.	Total Lehigh. TONS.
1820	365	- -	- -	- -	- -	- -	- -	- -	365
1821	1,073	- -	- -	- -	- -	- -	- -	- -	1,073
1822	2,440	- -	- -	- -	- -	- -	- -	- -	2,440
1823	5,823	- -	- -	- -	- -	- -	- -	- -	5,823
1824	9,541	- -	- -	- -	- -	- -	- -	- -	9,541
1825	28,396	- -	- -	- -	- -	- -	- -	- -	28,396
1826	31,280	- -	- -	- -	- -	- -	- -	- -	31,280
1827	32,074	- -	- -	- -	- -	- -	- -	- -	32,074
1828	30,232	- -	- -	- -	- -	- -	- -	- -	30,232
1829	25,110	- -	- -	- -	- -	- -	- -	- -	25,110
1830	41,750	- -	- -	- -	- -	- -	- -	- -	41,750
1831	40,966	- -	- -	- -	- -	- -	- -	- -	40,966
1832	75,000	- -	- -	- -	- -	- -	- -	- -	75,000
1833	123,000	- -	- -	- -	- -	- -	- -	- -	123,000
1834	106,244	- -	- -	- -	- -	- -	- -	- -	106,244
1835	131,250	- -	- -	- -	- -	- -	- -	- -	131,250
1836	146,522	- -	- -	- -	- -	- -	- -	- -	146,522
1837	192,320	33,617	- -	- -	- -	- -	- -	- -	225,937
1838	159,564	38,426	16,221	- -	- -	- -	- -	- -	214,211
1839	142,071	38,595	33,826	7,550	-	- -	- -	- -	222,042
1840	102,212	43,845	50,441	29,039	- 54	- -	- -	- -	225,591
1841	*78,166	*26,224	*21,247	*17,170	- -	- -	- -	- -	*142,807
1842	163,742	45,159	31,082	31.930	- -	- -	- -	- -	271,913
1843	138,825	54,692	43,950	26,814	2,844	- -	- -	- -	267,125
1844	219,245	70,335	70,168	2,866	13,749	- -	- -	- -	376,363
1845	257,740	77,230	70,266	1,843	23,914	- -	- -	- -	430,993
1846	274,663	85,870	98,109	- -	46,103	17,908	5,865	- -	522,518
1847	334,929	109,110	105,595	- -	50,847	32,840	10,247	- -	643,568
1848	336,569	84,930	86,641	6,391	71,101	65,531	10,425	18,605	680,193

The following Table shows the Imports of Foreign Coal into the United States, annually, from 1821 to the 1st July, 1848. The duty on Foreign Coal under the present Tariff, is 30 to 45 cents per ton, on board:

1821	22,122	1835	49,969
1822	34,523	1836	108,432
1823	30,433	1837	153,450
1824	7,228	1838	129,083
1825	25,645	1839	181,551
1826	35,665	1840	162,867
1827	40,257	1841	155,394
1828	32,302	1842	141,526
1829	45,393	1843	41,163
1830	58,136	1844	87,073
1831	36,508	1845	85,771
1832	72,978	1846†	156,855
1833	92,432	1847‡	148,021
1834	71,626	1848	196,251

* Great Freshet, which injured the canal.
† From 1st December, 1846, to 30th June, 1847.
‡ For the year ending 30th June, 1848.

In July, 1789, a law was passed laying a duty of two cents per bushel on Imported Coal. In 1790, the duty was increased to three cents. In 1792, the duty was increased to 4½ cents, and in 1794 to 5 cents per bushel. This duty was continued until 1816, when it was changed to 5 cents per heaped bushel. In 1824, the duty was increased to $1.50 per ton. In 1832, the duty was raised to $1.75 per ton, which was continued until the present Tariff, in 1846, reduced it to from 30 to 45 cents per ton.

The Coal Trade for 1849 will show a considerable increase over that of 1848. A satisfactory arrangement has been entered into between the Railroad Company and the Schuylkill Canal, in reference to the charges for Toll on Coal, which will prove advantageous to all those who have made investments in the stock of these companies.

GRAIN.

MEASUREMENT OF GRAIN, ETC., BY THE PUBLIC MEASURERS OF PHILADELPHIA.

The following Table shows the Measurement of Grain, Seeds, Salt, and Coal, annually, for the last eleven years.

	Wheat.	Corn.	Rye.	Barley.	Oats.	Seeds.	Beans.	Coal Bit.	Salt.
	Bushels.	Bushels.	Bushels.	Bushels.	Bushels.	Bushels.	Bushels.	Bushels.	Bushels.
1838	319,513	593,296	163,085	48,162⅛	272,104⅛	22,944⅛	1,401¼	138,712	356,407⅞
1839	449,980⅛	455,370⅜	115,933⅞	48,152½	302,274½	11,593½	327½	86,452	291,568
1840	770,205	602,858½	133,891⅜	36,542½	298,473½	18,248½	698½	165,740	257,143
1841	467,243⅜	781,278⅜	51,371⅜	44,336	167,508½	19,704⅜	3,040⅞	118,108	326,132
1842	462,770	492,951	36,334	35,978½	194,908	25,198⅜	1,616½	9,068	151,250
1843	484,384½	518,671¼	68,013½	20,012	372,713½	27,773½	1,580½	131,909	174,134⅛
1844	526,667⅜	640,459	95,227½	58,600	375,578⅜	42,358	1,402⅜	97,000	217,815½
1845	792,502⅛	768,486¾	85,357¼	46,630⅛	357,677½	31,434	3,930⅛	261,838	146,451
1846	983,923	665,178	30,829	40,339	350,942	15,864	3,895	348,261	237,463
1847	947,598	1,093,264	78,972	38,210	369,171	7,528	676	268,760	246,438
1848	723,694½	1,302,318½	46,900½	62,554½	327,733⅜	9,770⅛	459	357,827	200,474

OVER-PRODUCTION OF COTTON.

"We have seen very intelligent contemporaries, who agree with us on the necessity of some equilibrium in our capacity for production and consumption, who estimate our excess, already, at 800,000 bales, and who are of opinion that the corresponding ratio of labor should be at once diverted into other channels. On this predicate, the transition would be one-third from cotton, which, with all due deference, we think rather too violent. It would, probably, excite fears, alike injurious to agriculture and commerce, by disturbing the laws of supply and demand, which are most beneficial, when most secure from sudden and great interruption. We have selected the medium course, as the most advisable—let us say, that 400,000 bales ought to be omitted from the production, which would be one-sixth of a full average crop, as noticed by us a few months since, and the capital thus liberated would establish and work machinery to the value of $12,500,000. Let the proceeds be invested in additional cotton mills, and so on, from year to year, until a third of, or even one-half, the crop of the United States shall be manufactured at home. When this or any approximate result shall be attained, then good prices for cotton will be permanent, with the upward slide in our favor, from the very tendency of the change."

We take the above from the "Commercial Times," of New Orleans. The remedy for the over-production of cotton is to be found in the increase of the consumption, and not in the reduction of its cultivation. In the five years which followed the passage of the tariff of 1842, the home consumption of cotton was doubled. Restore that tariff, and it would again double itself in five years, and it would then be found that the planters would obtain more from the export of a million of bales than they now do from the whole crop, while the food that they would then raise would find a market on the land, enabling them to improve its power of production, instead of exhausting it, as now they do.

CONNECTION BETWEEN THE PLANTING AND THE MANUFACTURING INTEREST.

In the following passage, which we take from an article in the Philadelphia "North American," the estimate of the home consumption differs materially from the authorities we have followed, but our chief object in offering it to the consideration of our readers is that of showing the manner in which the present tariff operates as a bounty on the consumption of the cotton of India, and tends to produce that surplus of American cotton, of which the planter complains, and by which he is ruined. How long, we ask again, will it be before he will learn that the plough never has prospered, and never can prosper, in the absence of the loom and the anvil?

"It is a fact not generally known on this side of the Atlantic, that the principal imported cotton goods, which enter into competition with those made in this country, are manufactured almost exclusively of cotton grown in the British East India possessions, which, on an average for a succession of years, costs one penny, or two cents of our money, per pound, less than the American cotton.

"To illustrate this fact more clearly, it should be known that no cotton twist, or warp, from Nos. 5 to 20, except occasionally for home use, has been spun in England, within the last twenty years, of any thing better than East India cotton; and that all cotton filling, or weft, under No. 30, is spun of the same material. In this country the factories rarely, if ever, spin, for manufacturing purposes, any cotton yarn finer than the numbers above named; and they use the American cotton exclusively, at an average cost of two cents per pound above the value of the cotton used by the British manufacturer in making the same fabrics. It is, therefore, a natural consequence that, under a high protective American tariff, the consumption of American cotton is greatly increased, and that of the East Indies decreased; while, under a low or free trade tariff, the consumption of American cotton is materially decreased, and that of the East Indies increased. These facts, of so much interest to American cotton planters, will be clearly demonstrated by reference to the tabular statements contained in Wilmer & Smith's European Times, by which it will be seen that, from the first of January to the fifteenth of October, 1846, when the tariff of 1842 was in full operation, 1,002,150 bales of American cotton, and 240,380 bales of cotton from other countries, were consumed in Great Britain. During the same year, it is estimated that there were over 500,000 bales of American cotton consumed in this country by our own manufacturers; making an aggregate of 1,502,150 bales of American cotton consumed in both countries. Only about one-sixth of that number of bales, the product of other countries, it will be remembered, was consumed during that period. From the same authority it appears that, from the first of January to the thirteenth of October, in the year 1847, when the tariff of 1846 was in operation, there were consumed in Great Britain only 636,560 bales of American cotton, and 242,630 bales of cotton of the product of other countries. And it is estimated that, owing to the distressed situation of our manufacturers, there were not more than 300,000 bales consumed in this country; making only 936,560 bales of American cotton actually consumed in both countries during that period. It will be seen from these statements, that whilst the consumption of American cotton decreased 565,590 bales under the tariff of 1846, the consumption of cotton grown in other countries increased 2250 bales;—and further, that nearly one-third of all the cotton consumed in Great Britain during the period last named, that is under the tariff of 1846, was imported from British possessions; and the reason for this large decrease in the consumption of American, and large increase in the consumption of other cotton, is obvious—the English manufacturers were mainly engaged in producing coarse fabrics, which constituted almost the only description of cotton goods they could send here to advantage, and which were the best calculated to break down the manufacturing establishments of this country."

The Mississippi.—The Mississippi river runs through nineteen degrees of latitude, a space extending from the northern part of Ireland to the Rock of Gibraltar. At its source the winters have the rigor of those of Norway, and at its mouth the seasons are those of Spain. The fir and the birch grow about its northern springs—and the palm, the live-oak, and orange at the Balize. It is closed by ice in November in its northern course, which is melted early in the spring, before it has floated within many hundred miles of its mouth. "Lone, wandering, but not lost," it flows for the first four hundred miles through a high, prairie-like country, until it is precipitated over the falls; then, having descended from the high shelf of land it has lately watered, it flows for the next seven hundred through one of the most beautiful regions.—*New York Literary World.*

ON THE CULTIVATION OF ONIONS.

A PRIZE ESSAY.

We have observed that "town cows" always go, each herd, to its particular part of the commons to pasture, neither of the herds, though there may be a dozen, ever invading the grounds of another—so beggars in towns have each their particular walk. When the cows come home, from the pasture on the farm, or from the commons, you'll generally see precedence yielded to some old dame, one that has won the distinction rather by hard knocks than by amiable manners. All this is well described by Bloomfield in the "Farmer's Boy," where the clattering dairy-maid bawls out to Giles, "Go fetch the cows!" (We've a great mind to copy the whole poem.)

"Straight to the meadow then he whistling goes;
With well-known halloo calls his lazy cows:
Down the rich pasture, heedlessly they graze;
Or hear the summon, with an idle gaze;
For well they know the cow-yard yields no more
Its tempting fragrance, nor its wintry store.
Reluctance marks their steps, sedate and slow;
The right of conquest, all the law they know:
The strong press on, the weak by turns succeed,
And one superior always takes the lead;
Is ever foremost, wheresoe'er they stray;
Allowed precedence, undisputed sway:
With jealous pride her station is maintain'd,
For many a broil that post of honor gain'd."

Well, thus as with cows, in appropriating the commons, so with farmers and mechanics, as to the production and manufacture of certain things. They seem to be surrendered by a sort of prescriptive right to particular places, without any obvious reason why they should not be produced in a thousand others as well—

Newark, New Jersey, for light wagons; Troy, for post-coaches; Lynn, for shoes; and for onions, Weathersfield, Connecticut, where Paulding, speaking of the women, says, rather ungallantly, that at a certain season of the year,

"——— their knees
"Are rough as shag-bark walnut trees."

We have often wondered, when residing south of the Delaware, as we should ever have done, if we had not been (speaking of cows) *poked* out of it; we have often wondered why they should go to the Mohawk for brooms, and to Connecticut for onions, —but it seems they know how to make onions in Vermont as well. As soon as we saw the following in that excellent, because highly intellectual and moral paper, "The School Journal and Agriculturist," we determined to preserve it in the pages of the "Plough, the Loom, and the Anvil." One thing only had wellnigh deterred us from publishing it. Reader, would you know what that was? It was when we came to those lines which we have italicized at the end of section 2! We very much apprehend that in those lines is disclosed the very reason why the cultivation of the onion is monopolized by the Yankee. Well, be that as it may, here is a prize essay on its cultivation, which will leave no excuse for those who profess to be convinced of the expediency of every farmer making all he can "*within* himself." There is in this essay a corroboration of a remarkable fact which we heard some years since, for the first time, from Mr. Clapp, who enjoyed the *post* of Postmaster at some town in New England, under that glorious spoil-system of alternation which tends to make of every man in place a hypocrite or a beggar. He told us that onions did the better for being *grown perpetually on the same ground!*

CULTIVATION OF ONIONS.

[From a Premium Essay by J. W. Proctor, Esq.]

The culture of onions has increased so much, within a few years, in this vicinity, that it has become one of the staple products of the county, [Essex Co., Mass.] In the town of Danvers, more money is realized by the sale of the onion than in any other product of the soil. Products of so much value, and commanding so much attention, are fit subjects of inquiry; and if there be any facts relating to their cultivation not generally known, it may be useful to have them brought forward.

In making these inquiries, our attention has been directed almost entirely to practical cultivators, without reference to scientific treatises. Our intention being to tell their story, as near as possible, in their own way.

We shall treat of the subject in the following order:

1. The preparation of the land.
2. The manure best adapted to promote the growth.
3. The raising and planting of the seed.
4. The care necessary to be applied while growing.
5. The blights and injuries to which the crop may be liable.
6. The time and manner of harvesting.

1. As to the preparation of the land.

Differing from most other crops, the onion grows well on the same land for an indefinite number of years. Instances of continued appropriation of the same pieces of land to the growing of onions, for *ten, fifteen, twenty,* and even *thirty years*, have come to our knowledge. It is the opinion of many that the crop is better after the land has been thus used a few years than at first.

Rarely, if ever, have we known the onion sown upon the turf when first turned over. It is usual to subdue and pulverize the soil, by the cultivation of corn or some other crop. Not unfrequently the first year with corn, the second with carrots, and afterwards with onions. It is important, before the seed is sown, that the surface be mellow, finely pulverized, and clear of stones or other impediments to the free and unobstructed use of the machine for this purpose. The finer and more uniformly mellow the surface is made, the better. Shallow ploughing, say from four to six inches deep, is usually practised. Once ploughing only in the spring, and frequent harrowings, are practised. Before the ploughing, the dressing is usually spread upon the surface of the field, so as to be covered or intermixed in the furrow. The mingling and subdivision of it is effected by the use of the harrow.

Whether it would not be advantageous, occasionally to stir the land to the full depth of the soil, is a point on which there is a difference of opinion: most of the cultivators inclining to the use of shallow ploughing only. There are some facts tending to show that occasional deep-stirring of the soil does no harm to the onion crop, but on the contrary is decidedly beneficial. As for instance, onions do better where carrots have grown the year preceding, than after any other crop. The carrot necessarily starts the soil to the depth of ten or twelve inches. Possibly there may be some other influence upon the soil from the plant itself. Our belief is, that the thorough and deep stirring of it, is the principal preparatory benefit.

2. The manure best adapted to promote the growth.

Any strong manure, well rotted and finely subdivided will answer. But the general impression seems to be, that manure from stables, where the horses are freely fed with grain, is the best; and that it should be at least one year old, because it will not be sufficiently rotten in less time. All agree that the dressing for the land should be kept near the surface, well mixed, and as fine as possible.

Leached ashes are also a valuable manure in the cultivation of the onion; more so when *leached* than before. All kinds of ashes are advantageously applied on onion land.

Compost manure, made of meadow mud and the droppings from the cattle, we have known to be advantageously applied on onion fields; but we have many doubts as to this being the best application of this kind of manure. A more lively and quickly operating manure is better for the onion; one that will give them an early start, and advance them as fast as possible, in the first part of the season. The utmost vigilance and activity is used by

our cultivators in getting their land ready, at an early period of the season, for the reception of the seed. It is the first field labor of the spring. The use of compost manure will depend much upon the constituents of the soil with which it is mixed. If the soil be a sandy loam, with a porous subsoil, the compost will do tolerably well; but if it be a black soil, with a clayey subsoil, such as are most of the lands where onions are raised in this vicinity, stable manure, or muscle-bed, or leached ashes, or a mixture of these, will be a better application. The quantity ordinarily applied annually is from four to five cords to the acre. Whatever is applied should be generously applied. It will be in vain to expect full crops of onions without full manuring. When the manure is collected, it is benefited much by a free application of *elbow grease* in its preparation. *The cultivator of the onion must work early and late and in good earnest. Nothing short of forcible and persevering labor will answer. No one who is afraid of soiling his hands, or the knees of his trousers, will do to engage in this business. Close work, at the proper time, is the only sure guarantee of a good crop.*

3. The raising and planting of the seed.

In relation to the onion, as well as all other vegetables, much care is necessary in the selection of the plants for seed, and the cultivation of the seed. By the application of this care, the character of the article raised may be modified almost at pleasure. Until within a few years the *flat onion*, hollow about the stem, has been preferred. The thinner the handsomer. But it is now understood, that the *round, thick, plump onion*, is preferable in many respects. It is found to have a decided preference in the market, commanding *ten per cent.* more in price. By selecting those of most desirable form, which ripen the earliest, and carefully setting them for seed, where they will not be exposed to the impregnation of the baser sorts, the quality has been materially changed and improved. These peculiarities in the onion were first noticed in this vicinity by Mr. Daniel Buxton. He was careful to select in the field before the crop was gathered, such onions as he preferred, and to preserve them for seed.

By so doing, the seed which he raised soon acquired a character superior to any other. Many of those who had been accustomed to raise their own seed in the ordinary way, laid it aside, and purchased seed raised by Mr. Buxton, and found their account in so doing. There are three varieties of the onion raised in this vicinity—the *Silver-skin*, the *Red*, and the *White* onion. The silver-skin is the predominant species, and more cultivated than all others. The red is preferred by some—sells better in some foreign markets, but does not yield so abundantly. The white onion yields as well as either of the others, is milder and preferable for immediate use; it will not keep as well, and is not fit for exportation; which is the principal use made of our onions.

The common drill machine is used for the distribution of the seed. This admits of regulation, so as to scatter it more or less thick; and in this there is room for the application of sound judgment. The usual quantity sown is about three pounds to an acre. As a general rule, we should say, one pound of good seed was the proper quantity for a quarter of an acre of land of good quality well prepared. It is desirable to have the seed planted as thick as they will grow fairly, both to secure a good crop, and prevent the onion growing too large. Onions from one to two inches in diameter being preferred to those of a larger size. The skilful cultivator carefully looks after all these incidents relating to his crop.

4. The care necessary to be applied while growing.

Much of the success of the crop depends on this care. At first the plant is extremely tender, and requires to be handled with much caution. Any

derangement of the fibres or roots of the young plant, is attended with prejudicial consequences. Much attention is necessary to prevent weeds gaining the ascendancy; and in eradicating the weeds. Want of due care in this is often the cause of failure of a crop. We have known, the present season, a highly promising crop to be injured *twenty per cent.* at least, by permitting the weeds to remain unnoticed *one week too long.* This is especially true when there has been a want of due care in preventing the scattering of the seeds of the weeds on the land in the years preceding. Care should be taken, both that no weeds shall ripen their seed upon the land, and that no weeds shall be found in the manure. In this respect, warm stable manure, muscle-bed, and ashes, have a decided superiority over all other manures. Perhaps there is no plant more liable to be injured by weeds than the onion. The fibres it sends out are very numerous, minute, and tender; any fracture of any of these necessarily impairs the perfection of the plant. When the land is in the proper condition, two careful weedings are all that may be necessary. The rest of the stirring of the ground that may be required to promote the growth, can be done with the *Onion Hoe*—an instrument specially constructed for the purpose, moving on wheels, and adapted to the width of the rows. It is calculated to pass between the rows of onions—being either drawn or pushed. The wheels cover a space of about one foot in width, and the length of the cutting blade is also about a foot. The length of the handle is about five and a half feet. The usual distance between the rows is fourteen inches, and as the hoe takes a breadth of twelve inches, it cuts over all the ground, excepting a strip of two inches along each row. The cost of the hoe varies from **$1.25** to **$1.50.** It was invented by Mr. Joseph Bushby, of Danvers, an intelligent and successful cultivator of garden vegetables, about 25 years since; and was used by himself and neighbors only for about ten years. It has now come into general use, and saves much of *back-aching labor.* The distance between the rows can be varied according to the quality and condition of the soil. Keeping the ground well stirred, loose, and free of weeds, greatly facilitates the bottoming of the onion. There is no plant that will better reward diligent care in the cultivation. The entire difference between a bountiful crop and no crop at all, often depends on this. The old maxim, "a stitch in time saves nine," applies with great force in raising onions.

6. The time and manner of harvesting.

When the tops begin to wither and fall, then it is usual to start the onions from their bed, and throw them together in rows—say eight or ten growing rows into one. After they have lain thus about one week, they are stirred and turned with a rake, and in about one week more, when the ground is dry, and the weather fair, they are gathered up by cart-loads, and taken to the barn. Here they are sorted and cleared of refuse leaves, and then they are in a condition to be *bunched* or *barrelled.*

It should be remarked, that a large part of the labor of *weeding*, *gathering*, and *sorting* the onion, can be performed by children from ten to sixteen years of age. Boys of this age, when properly instructed, will do about as much as men. They are more nimble, and can come at the work with greater facility. The sorting of the onion is frequently done by girls as well as boys. From three to five dollars a week, at one cent a basket, are usually earned by them during the period of harvesting—which includes the months of September and October. After the crop is taken off, if the surface is sloping, it is useful to plough furrows about one rod apart, to keep the surface from washing. Unless this is done, all the herbage being gone, much of the soil will be likely to be misplaced, by the melting of snows and running of water in the spring.

The inquiry arises, whether the growth of the onion is limited to soils of particular character, or whether it can be cultivated upon any good soil, with proper attention. We know that there is a popular impression, that there are but few places in which the onion can be cultivated advantageously. So far as our own observation has extended, this impression is in a great measure erroneous. Like every other plant, the onion grows best on very good soils, in very good condition. But we have known very fair crops, on plain, light land, after the same was well saturated with *manure, muscle-bed, and ashes.* A good substratum must be laid before a good crop can be expected; and this being done, a crop may be expected on almost any soil that will support other vegetables.

If we were asked what course is best to be pursued with land, on which onions have never been raised, to bring it into a condition for a successful cultivation of the crop, we should say—Begin by ploughing to the full depth of the nutritive soil, and during the first and second years, thoroughly subdue and mellow the soil by the cultivation of crops of corn and carrots, with liberal dressings of manure; then thoroughly incorporate with the soil a dressing of strong manure and muscle-bed, just covering this dressing; then harrow the surface thoroughly, and clear it of all roots, weeds, or other obstructions; then apply a coating of lively, well rotted manure to the surface, and bush harrow it; and then it will be in a condition to receive the seed, which is to be inserted as soon as the opening of the spring will admit of its being done.

We are aware that we make the raising of the onion dependent upon severe labor and vigilant attention. We know that it cannot be successfully done without these. But it is not labor lost. No cultivation, within our observation, better repays for the labor and incidental expenses. We have known, the present season, acres that have yielded their owners a net income of more than *three hundred dollars;* and we know that a man with two boys can well attend to half a dozen acres of such cultivation. Surely, when as at present, there is no limit to the demand for the article, and a ready cash market, those who have *acres* and are willing to labor, need not be in want of a fair compensation for their labor.

As samples of the present year's product in the town of Danvers, we state the following that have come under our notice:

Names.	Acres.	Product.
John Peaslee	3	1,980 bushels.
Daniel Osborn & Son	1½	870 "
James P. King	1⅔	660 "
Aaron C. Proctor	1¼	600 "
E. & D. Buxton	6½	2,750 "
Henry Bushby	4	2,000 "
Joseph Bushby	3	1,500 "

Yielding an average of more than 500 bushels to the acre.

Advice in Poultry Keeping.—The principles upon which I rely for success in keeping hens, are, 1st, to have two breeds—a few to hatch and rear the chickens, and twice the number of everlasting layers, as eggs are more profitable than chickens; 2d, to get a hatch as early as possible in spring, and to keep them well; these never cast their feathers like the old birds, and if they begin to lay in autumn, lay more or less all winter; 3d, never to keep old fowls (none but favorite fowls ought to be kept more than two years;) old birds lay larger eggs than pullets, but not nearly so many; 4th, to give them the best barley I could get, and as much as they could pick up once a day in summer, and twice in winter; they are not only more profitable, well kept, but the eggs are better.—*English Paper.*

THE MARYLAND STATE AGRICULTURAL CHEMIST.

"Dr. Higgins, the Chemist, has, we understand, removed his Laboratory to Easton, where he is now assiduously engaged in his great work. He has been met there by the farmers, in the best spirit, and their attention has been in various ways attracted to his labors."—*Ann. Free Press.*

The above, from the "Baltimore Patriot," is the first and only notice we have seen of the whereabouts and of the operations of the State Agricultural Chemist. Doctor Higgins has a wide field for usefulness before him, and while we trust, we doubt not he will cultivate it well.

The very presence of an officer thus traversing the country, will wake the farmers up to a consciousness that in the great scale of human industry agriculture is "some," and the best results in a great manufacturing process, (which agriculture really is,) are not to be achieved but by some knowledge of the *nature* of the materials employed, and of the *laws* of nature on which all results, profitable or otherwise, in a great measure depend. Perhaps, as the very worm will turn when trodden upon, farmers will at last begin to inquire why it is that *they* maintain great military and naval schools, while their representatives (so called) dare not ask for one dollar for instruction in the great art of production.

The number of our patrons on the Eastern Shore of that good old State, and the interest we shall never cease to feel in the prosperity of all her sons, warrant a curiosity to know, when allowable, the result of Doctor Higgins's analysis of their soils and materials—their fine "white oak" wheat soil, their marsh mud and their marls. On the left hand side of the road coming into Easton from Queen Anne's, and not many miles out, we stopped to look at the operation of marl-digging, near the road, which seemed to be attended with a quantity and cost of manual and animal labor to make it doubtful if it would pay! How would it compare, for instance, with the following Irish marl, of which Dr. Kane gives the analysis:

	Blue Marl.	White Marl.
Siliceous sand	2·35	20·72
Alumina	0·36	0·74
Oxide of Iron	0·24	0·32
Phosphate of Iron	0·03	0·02
Carbonate of Magnesia	0·43	0·53
Carbonate of Lime	90·98	77·04
Organic Matter	2·42	trace.
Water	2·52	1·03
	99·33	100·40

The following analysis is given by the same author, whose valuable work ought to find a place in every farmer's library. This may serve to hint, in some measure, to a certain friend whose plough we once found in autumn, laid by, where it had laid by his corn in the summer, and who, therefore, shall be nameless—what he has to expect from his use of king-crabs in his compost, making to the value of the shells, the addition for the animal matter. How much is to be added on that account, it is not easy to say, as we could never see in these odd-looking creatures any thing but shell and legs.

	Crab-shell.	Lobster-shell.	Oyster-shell.
Animal Membrane	28·6	44·76	0·5
Carbonate of Lime	62·8	49·26	98·5
Phosphate of Lime	6·0	3·22	1·0
Salts of Soda	1·6	1·50	--
Phosphate of Magnesia	1·0	1·22	--
	100·0	100·00	100·0

Dr. Kane says that almost all the bogs in Ireland rest on marly bottom, intermixed with beds of clay, or of limestone gravel, in such manner that these wastes, where they become unnecessary for fuel, contain underneath the best materials for their own reclaiming. So it may be with the marshes along our whole seaboard; and as we get so little in return for fifteen or twenty millions expended annually on the army and navy, we venture here to make one suggestion; and that is, that to the corps of coast-surveyors, should added, in time of peace, the corps of *sappers* and *miners*. Let them accompany the coast-surveyors, whose beautiful maps extend to a certain distance from the shores of all our rivers and creeks. We have seen, for instance, an exquisite map of Blakeford, in Queen Anne county, made in the regular course of coast-surveying. Well, what we would propose is, that these miners might indicate on these maps not only the extent of the marshes, and the rise and fall of the tides, (to indicate whether drainable or not,) and the elevations of the adjacent dry land along the shores within the scope of their survey—all of which may, for aught we know, be done now; but they should also indicate any large deposits of shells or marl, or bog, fit for fuel. In a word, we would get all out of them that we could, in return for the hundreds of millions expended in time of peace to *prepare for war!* In the meantime, we wish all honor and success to the State Chemist.

"THE ECONOMIST" is the title of a paper to be issued early in April, at Cannelton, Indiana, to be published weekly. The Editor—CHARLES H. MASON—says:

"We shall endeavor to show to the cotton planter that there is more economy in working up his staple by the cheap coal of Indiana, than by the expensive coal of England. To the Western grower of food, we shall undertake to prove that there is more economy in feeding the spinner and weaver on the banks of the Ohio, than in Manchester, Glasgow, or Lowell. In short, we shall endeavor to show whatever economy and profit there is in developing the natural resources of the country, and, in so adjusting our capital and labor in agriculture, manufactures, and their auxiliaries, that all may harmonize and yet no one unduly preponderate."

It would be superfluous in us to say that we approve heartily the objects of "The Economist," but we may add that we have every confidence in the ability and resources of the Editor to make his work acceptable and valuable to all who would be familiar with the industrial resources of his country, and the best and most economical manner to develope and apply them.

How to make a Horse Sure-footed.—A singular account of the manner of the ancients in breaking their horses, and rendering them sure-footed when galloping over the most irregular and dangerous grounds, is related by Vegetius. The Parthian horses were lighter and hardier than those of the Cappadocians or Medes, and were the best war horses. A spot of dry level ground was selected, on which various troughs or boxes filled with chalk or clay, were placed at irregular distances, and with much irregularity of surface and of height. Here the horses were taken for exercise, and they had many a stumble and many a fall as they galloped this strangely uneven course; but they gradually learned to lift their feet higher and to bend their knees better, and to step sometimes shorter and sometimes longer, as the ground required, until they could carry their riders with ease and safety over the most irregular and dangerous places. Then it was that the Parthians could fully put into practice their favorite manœuvre, and turn upon and destroy their unsuspecting foes. They were as formidable in flight as in attack, and would often turn on the back of the animal, and pour on their pursuers a cloud of arrows that at once changed the fortune of the day.—*English Paper.*

NEW INDUCTIONS IN AGRICULTURE.

BY DOCTOR R. T. BALDWIN, OF WINCHESTER, VIRGINIA.

Messrs. Editors of the Plough, the Loom, and the Anvil:

THE inductions I have drawn from the practical facts which have passed under my personal observation, since my attention has been directed to the subject of agriculture, differ so materially from the received opinions of the present day, that I have been induced to submit them for your consideration: under the hope and expectation that you or some one equally qualified, will correct them if they should prove to be erroneous. With this view, I shall state them in distinct, substantive propositions.

1st. It is not true that any plant which the farmer is interested in cultivating, derives its principal nutriment from the carbonic acid gas of the atmosphere. Although air is indispensable to vegetable as well as to animal life, it is equally true that no animal can live without food, and no plant exist in an impoverished soil without manure at the root.

2d. That the only food of plants known to the practical farmer is manure, or the residue of putrefaction. Neither water, oil, carbon, phlogiston, nor the sulphates, nitrates, muriates, carbonates, silicates, phosphates of soda and potash; nor the carbonates, sulphates, phosphates of ammonia, lime, magnesia; nor acids, nor alkalies, have ever been *proved* to be the aliment of plants, unconnected with the putrefied substances which may contain them.

3d. It is not true that different vegetable matters, during their growth, extract different fertilizing salts from the earth. For lands exhausted by continued cultivation in one kind of grain will not produce a more remunerative crop of any other kind.

4th. It is not true that lands under cultivation cannot be made to preserve their natural fertility without manure; on the contrary, lands naturally poor may be made exceedingly fertile without the addition of manure, of any kind whatever.

5th. There is no natural disintegration of the soil in a state of repose, and a formation of alkalies, unless its surface be covered with some substances or other. Exhausted lands, which remain uncovered, never improve in fertility by rest.

6th. The residue of the decomposition of vegetable substances, or the "ash of plants," is not manure. Nor can manure be made of *any substance*, without the aid of the putrefactive process.

7th. That the analytical investigations of learned chemists, totally disregarding the vital principle or life, have not promoted the interests of agriculture. On the contrary, diverting the attention of agriculturists from careful observations of the operations of nature, and the inductive reasonings drawn therefrom, have been decidedly injurious to its best interests.

8th. That shade is the great fertilizing agent; the putrefactive fermentation cannot be produced without it, and consequently no manures can be made, and no fertility imparted to the earth, *in any manner*, independent of its influence.

9th. That the earth itself is capable of being converted into the best manure; to effect this, it is only necessary that it should be densely shaded. That is, it should be located favorably for the generation of the putrefactive fermentation.

10th. That the fertility imparted to the soil is more permanent, when produced by shade, than from the application of any manure whatever.

11th. That every particle of earth, as it is naturally constituted, contains a portion of the fertilizing principle. The surface earth, or "mould," is fertilized earth itself caused by shade, and not the residue of vegetable decomposition.

12th. The difference in the fertility of the soil, in our native forest lands, arises solely from the circumstance of the surface soil being more or less densely shaded. Pine, which have no leaves, and white and red oak, which part with theirs so reluctantly, never leave the surface soil so fertile as those trees which drop their leaves with the first frosts.

13th. Many plants do impart more fertility to the soil than they extract from it during their growth,—not in "excrements," but by their shade.

14th. The natural provision for the renovation of worn-out lands appears to be this:—That some plants, like some animals, require but little food; these thrive best on the poorest soils. Every practical farmer knows, that if additional fertility be given to the soil, they disappear almost magically.

15th. However industrious and energetic a farmer may be, he cannot continue to cultivate a farm exceeding one hundred acres, and preserve its natural fertility by manures made on the farm. He attempts an impossibility, and must fail.

16th. Through the agency of shade, every farmer may fertilize every acre of land which he is able to cultivate. In this, consists the perfection of agriculture.

I most sincerely believe that these propositions may be abundantly sustained by facts, prominently before the observation of every agriculturist.

Yours, with respect, R. T. Baldwin.

MR. EARLE'S RESOLUTIONS,

In favor of appropriations by Congress, for agricultural instruction, to an amount equal at least to what may be given for instruction in the use of the cannon and the sword, passed unanimously by the Maryland State Agricultural Society, have been communicated to the members of both Houses of Congress, with earnest suggestions of his own, by the ardent and indefatigable President of the Society. The answers from the members indicate, we understand, an honorable sensibility to the justice of this demand upon the government, but it was hardly to be expected that any thing would be done at this session. Fortunate is it, that the wedge has been entered at last, and if it be not driven home, the landed interest will have no one to blame but themselves. The next best thing they can do, to insure success, is to prevail with the conductors of the public press to co-operate. That the press itself is becoming mindful of the claims of agriculture on the public attention, is evidenced by the fact that many of the leading journals are opening one or more columns to be regularly dedicated to that subject. We wish we could see the State Societies of other States coming up to the line of right and of duty to their constituents.

The Prize Farms on the Eastern Shore of Maryland.—The very interesting reports, in respect of these farms of Dr. Clough and Mr. Covey, with some observations of our own, were sent to the printer for this number, but the "devil" came back and said there was no room. It will be well for all whom it may concern to bear in mind, that whatever is to appear in this work must be in the hands of the printer the first week of the previous month.

HONOR TO THE SPADE AND THE PLOUGH.

When the sagacious people of Boston find a man who has something in him, they know how to turn him to the best account—but well they know the true from the sham. *They* are not people to be led away by humbugs. Quickly they discern the difference between a working man and a bag of wind. Such a working man they found in Col. M. P. Wilder, late President of the Horticultural Society; and they would not let him off until under his lead they placed that institution on a footing that does honor not merely to Massachusetts, but to our whole country. When at last they allowed him to resign, they unanimously passed to him a vote of thanks, at the instance of that accomplished pomologist, B. V. French, and a piece of plate of the value of $150, with a suitable inscription. We shall publish these proceedings, for the sake of deserved honors done to others as well as to him. But scarcely does he free himself from one harness before others are buckled on. We perceive by "The Boston Journal," that he has since been elected a Counsellor to Governor Briggs, and President of their Agricultural Club, which meets in the State House at Boston, and yet more recently was unanimously chosen to be the President of the Norfolk Agricultural Society, which now completes the list—one in each county in the State. So much for having the loom and the anvil near the plough.

In reference to Agricultural Societies, Mr. Wilder said they are of recent origin. The first of the kind in this country was the Pennsylvania Agricultural Society, established in 1785; the Massachusetts Society, still in existence, having a name to live—established in 1793. The first Horticultural Society in the world was established in London, in 1805, the Royal Society at Paris, in 1826, Pennsylvania Society, in 1827, and the Massachusetts Society in 1829. As one evidence of the growth of horticultural taste, he said that at the first exhibition of the Society in Boston, Mr. Manning, the American pomologist, showed but two dishes of fruit, while at the exhibition last fall, the heirs of that gentleman showed 300 specimens.

Several interesting speeches followed, giving evidence of the most cordial and hearty feeling, and the great unanimity which prevailed in the meeting. But the most *effective* and exciting speech of the day, was that made by Samuel Walker, Esq., of Roxbury, Chairman of the Finance Committee. He made a partial report, announcing the following donations to the Society: Charles F. Adams, $300; Marshall P. Wilder, $100; B. V. French, $100; Aaron D. Williams, $100; and $270 from subscription members at $5 each. These several announcements were received with enthusiasm, and the spirit of the meeting being on the giving hand, gentlemen pledged their towns as follows: Roxbury, $500; Dorchester, $400; Needham, $100; Quincy, $100; Dedham, $300; Dover, $50; Wrentham, $200; Milton, $100; and the pledges continued to come in until the funds of the Society amounted to nearly $3000!

An act of incorporation will be applied for immediately, and the Society will enter at once upon its large field of usefulness, fostered by the bounty of the State, and the liberality of its wealthy members.

After passing the customary vote of thanks to officers and benefactors of the Society, and one particularly to E. K. Whittaker, Esq., the prime mover in this noble enterprise, which was responded to by that gentleman in the most eloquent terms, the Convention adjourned *sine die*.

Thus we see, that much as we in the "sunny South" are in the habit

of associating with these Yankees the idea of *close-fistedness*, when you prove to their minds that the thing proposed is *useful*, where will you find men to open their hands quicker or wider?

How much mankind are given to talk without very well knowing what they are talking about! How many farmers can you find to give even $3 for the support of the Philadelphia Agricultural Society? In some counties in New York, it is not easy to make up a few dozen subscribers at (we believe) 50 cents each!

It may, we believe, be added, historically, that De Witt Clinton, Judge Buel, and J. S. Skinner, were among the very first Americans on whom was conferred the honorary membership of the great Horticultural Society of London.

ON FATTENING CATTLE.

BY GEORGE DOBITO.—PRIZE ESSAY.

We do not feel authorized to withhold the following, because the writer recommends *turnips* and *cake*—for the *system* is otherwise worthy of attention, and every reader can substitute corn-meal for cake. But has any one ascertained that oil-cake may not be used with economy in this country? Everybody knows, we presume, that a large portion of its value consists in the value it imparts to the manure. As to turnips, although our climate, except in the mountains, may be too dry for them, mangel-wurtzel, which is also highly spoken of, may, we know, be raised in immense quantity. We should be glad if some gentlemen in the valley, or South branch of Virginia, would give us a paper on fattening cattle in that region—its cost and results, and the manner of conducting that branch of husbandry after the most approved system.

[From the Journal of the Royal Agricultural Society of England.]

Presuming that the object of the Council of the Royal Agricultural Society of England, in offering prizes for essays on various subjects, is that the farmers themselves may be induced to commit their practice and experience to paper, I trust that my humble attempt to describe what I have found to be the best method of fattening bullocks, if considered unworthy of a prize, may at least be criticised with lenity, as it is the *bonâ fide* production of a practical farmer.

The first point I wish to impress upon my readers is, to have a good sort of bullock to begin upon; not that I wish to recommend one particular breed, to the depreciation of all others, for I am sure that different localities require different descriptions of animals; but to caution them that it is right to select the characteristic marks of the breed they intend purchasing—to warn them particularly never to buy a coarse, ill-made, bad-bred animal, because they may fancy it cheap. A man has never got so bad a bargain, as when he has, as the saying is, "got too much for money."

The first criterion for judging of the disposition of the beast to fatten quickly, in my opinion, is that peculiar soft, supple feel of the skin which is commonly called handling well; this is generally accompanied by hair of a soft, fine quality, in great plenty; the eye should be full and clear, and the head well-formed, the shoulders not upright, but lying well back, the chest full, the ribs deep and well arched out, the flanks well down, the hips nearly level with the backbone, and in proportion to the rest of the carcass as to width, the rumps wide, and not too low down, appearing as if when fat the tail and rumps' ends would be level, (but this the butchers in my neighborhood are in the habit of calling the fool's point,) the purse should

be of a full size, and soft to the touch, (this I consider a material point,) the twist good, and the legs short and small in proportion to the carcass, as the offal will be light in proportion to the leg-bone.

Next observe the temper of the animal: in selecting from a considerable drove you will often find beasts possessing many of these good points, yet in lower condition than some of the animals of a worse appearance; consider well whether this may not arise from the masterful disposition of the ill-made one; and whether, when put to fatten where every beast may eat his share of food without disturbance, the good-bred one will not soon surpass his more masterful neighbor. If you observe a beast that is constantly watching an opportunity of goring any other that comes in his way, leave him behind, even if he is much heavier than those you select; he may be a great trouble to you: and although the jobber may think you have selected them badly, he will sell them according to what they are worth at the time, and the present weight is the great point with him. For this reason always select the animals before purchasing, rather than agree to give a certain price per head to pick where you like from the drove.

I think the quality of an animal is of more consequence than his form, for common fattening purposes, but have both good if you can. But if you are thinking of fattening an animal to show for a prize, be sure to have his form as perfect as possible; for all the flesh you may lay on him will not hide any great defect in his form: also ascertain, if possible, how the animal is descended; ten to one but the progeny becomes similar to the progenitor. But this is generally a most unprofitable affair, and I strongly recommend all young farmers to leave it in the hands of those gentry who can afford the loss, many of whom there are in the country, and they deserve our best thanks for their patriotism, for it certainly shows the capabilities of different breeds, and thereby enables the observing farmer to profit by the experience of others. Never buy any animals that are *excessively* poor; they will consume a great deal of food before they are got into health enough to fatten.

I fear I have been rather prolix in these remarks, but have thought it necessary; for, depend upon it, unless your animals are well bought, fatting cattle will never pay enough to leave the manure clear profit, which it ought to do, although, I fear, with the majority of farmers, it is far otherwise.

I shall say but little with respect to summer-grazing, as the wording of the Society's advertisement appears to apply more particularly to winter fattening; merely remarking that the fences should always be kept thoroughly good, a weak place being strengthened before it becomes a gap, prevention in this case, like many others, being better than cure; that the bullocks should be well supplied with water, and have plenty of shade; never allow them to be frightened by dogs, &c.; treat them kindly, and they will soon cease to fear your presence; do not let a day pass, if you can help it, without seeing them. There is an old saying, which ought to be impressed on every farmer's memory—it has been of great service to me in the course of my life—it is, "The master's eye grazeth the ox." A friend of mine has lately adopted a plan which, under the same circumstances, I should strongly recommend; it is that of giving a small quantity of oil-cake to animals grazing, for the sake of improving an ordinary pasture, and its effects are astonishing. The pastures I allude to are small, and one or two bullocks more than they are calculated to carry are put into each; the lot are then allowed 4 lbs. of cake per day per head; this, at a cost of about 2*s.* (50 cents) per head per week—which, I believe, the stock well paid for—has entirely *altered the face of pastures* from what they were three years ago, when the plan was first adopted by him; and, I believe, without any loss to himself.

I now come to the point of winter feeding. First, as to the places in which they are kept, I unhesitatingly give my opinion in favor of stall-feeding, for all the common purposes of grazing; but not for young beasts that are to be summered again, or for prize oxen: the former should have small, well-sheltered yards, with good sheds, (if the fences are so high that they cannot see over, it is much better;) and the latter, *loose boxes*, with plenty of room for them to walk about, because they have to be kept up for such a long period, that if no exercise were taken the health might suffer. It is the abuse of stall-feeding that has got it into disrepute with some people, and the not treading down straw enough with others. This last I hold to be an advantage, instead of a disadvantage; for, depend upon it, it is not the size of the dunghill, but the *quality of the manure* that causes the farmer's stack-yard to be well filled. If managed well, I contend that there is no plan so good as stall-feeding. The fattening-house may be of any size or shape, but it is necessary that there should be underground drains, with gratings, to carry off the urine into the liquid-manure tank; shutters behind the bullocks to regulate the heat, and a wide passage at their heads to feed them and clean their mangers. The advantages I conceive to be the quantity of litter required being smaller, therefore the muck being made better; the temperature being more easily regulated, and every bullock being allowed to eat his share in peace. The disadvantage of the animal not being able to rub himself so well, I consider fully done away with by the rough brush which you will observe I recommend using; and although theorists may fancy the health of the animal likely to suffer, I have never found it so in practice.

Now, with respect to their food, so much does this vary, (from the plan pursued by some people with an ox intended to be shown at Smithfield, in a class restricted from corn, cake, pulse, &c., *which has the cream from several cows given him*, by way of compensation, to that by the man who endeavors to fatten his animals on turnips and barley-straw,) that it would take up far too much of the Society's valuable journal even to enumerate them; I shall therefore simply give the plan I recommend, leaving my readers to follow it if they like, and improve upon it whenever they can.

I think, in many instances, stall-feeding is not commenced early enough in the autumn: as soon as the weather becomes damp, and the days shorten much—say some time in October—the grass in my neighborhood loses its feeding properties, and then the sooner your bullocks are put up the better; for this purpose I recommend having some of the large, forward descriptions of turnips provided, perhaps the "red tankard," although watery, and soon becoming of little value, are at this very early season the best of any, from their early maturity; these are sown in April, at the rate of an acre to every eight bullocks, which will last them three or four weeks, according to the crop, and leave a light fold to begin the sheep upon; at the end of which time the forward swedes are ready to begin. During this period I give them little or no oil-cake, if they are only in moderate condition; but they have half a stone of pollard a day, mixed with an equal quantity of hay or straw-chaff. Some persons may fancy this food is of too loosening a nature, but I can assure them, from several years' experience, that although pollard is loosening itself, yet it has the effect of preventing the watery white turnips from purging too much. Although the bullocks do not gain much in weight during this time, yet I am satisfied they go on faster afterwards; the reason of which, I suspect, is that their bodies are more prepared for the artificial state they have to live in for the next few months. Early in November the food must be changed to swedes, cake, &c.; the quantities of each must vary according to circumstances: the following I consider a good allowance

where swedes are not scarce; if they are, more oil-cake must be given instead of a part of them; or, if very plentiful, they may be allowed even more. The morning's bait, 1 bushel of swedes, well cleaned from dirt, and cut small, given a few at a time, (I always use Gardener's *sheep turnip-cutter* in preference to any other;) then, the refuse pieces being well cleaned out, a dry bait, consisting of 2 lbs. of oil-cake, 3 lbs. of pollard, and a little hay-chaff. While they are feeding, the manure and wet litter must be well cleared away, and any which may be on the bullocks taken off, the floor swept clean, and plenty of fresh litter put in; then have every bullock well brushed with what is called a dandy-brush, (being a brush made with whalebone, for taking the rough dirt off horses.) Let not any slovenly farmer fancy this to be a whim of mine; depend upon it, the bullocks are kept in much better health and greater comfort for it. They must now be left quiet; they will soon lie down and rest, and chew the cud till after dinner, when another bushel of swedes is given as before, in small quantities, followed by a similar dry bait of cake, pollard, and hay-chaff, but with the addition of 3 lbs. of bean-meal; this is left with them at night. Be careful that the shutters are opened or closed, according to the weather, so as to maintain an even, warm temperature, but not hot enough to make them perspire, if it can be avoided. Be also careful that the mangers are well cleaned out between every bait. I have mine cleaned at the commencement of the season, and as often afterwards as I think necessary, with scalding water and the scrubbing-brush.

After a month or so the cake may be increased; and, if it is thought more convenient, the swedes may be changed for mangold-wurtzel. Many persons object to using mangold until the spring; they certainly are more valuable than swedes in the spring, and therefore should always be used last. Never change from mangold-wurtzel to swedes after you have once begun them, or the bullocks will not go on so fast; but if, from having a bad crop of swedes, or from any other cause, you want to begin mangold early, you have only to lay them exposed to the air for a week or two to wither, and they may be used as early in the season as is required.

It will be observed that cleanliness, warmth, and quiet are the great points I insist upon; of course coupled with good feeding: but very many tons of oil-cake are annually wasted, because the comfort of the animals is not more attended to. It will also be observed that I have introduced a cheap article of food, which I think does the beasts more good, in proportion to its cost, than any thing I give them: I allude to pollard, or millers' offal, as some call it. This I can generally purchase at 4*l.* 15*s.* a ton. I have used it extensively for some years, and like it much; some of my neighbors are now following my example.

Before I conclude, I wish to give these recommendations respecting selling the bullocks when fat. Do not determine upon parting with them exactly at any given time; but if a butcher wants to buy a part of them, a few weeks before you think them ready, calculate how they are paying for what they have eaten; and, if you feel satisfied on that head, do not run the hazard of getting a bad sale by refusing a good offer, or perchance the opportunity may not return. Sell them to butchers at home, if you can. Always estimate the weight and value of your bullocks the day before any one is coming to buy them; and, after letting the butcher handle and examine them well, let them out into a yard for him to see; they will always show better than when tied up.*

[* Our impression is, agricultural improvement will advance as the practice of soiling and stall-feeding increases.—*Editors P. L. & A.*]

AGRICULTURAL DISCUSSIONS AT BOSTON.

Just as the number was ready for the press, the Boston Journal brings us the proceedings of later meetings at the State House. With these men, it seems "stormy weather" whets, instead of cooling their ardor. Why do we hear of no such meetings at *Harrisburg?* We wish we could make room for all that is said on these occasions. How idle, as one of our correspondents says, for farmers, who have at least three hours at command in winter nights, to pretend that they don't patronise agricultural journals because "they have not time to *read.*" None so deaf as those who *won't* hear.

We have only space to glance at one or two things mentioned. The subject was *manures*, to which the whole discussion was confined. They did not spend their precious time in talking about *portu lacca*, or *Hafiz wine*, or dahlia roots springing into life and beauty, after being 2000 years in the hands of a mummy!!

"The third of the series of agricultural meetings was held, Tuesday evening, in the Representatives' Hall. Subject for discussion—*manures.* The discussion was opened by the President, Hon. Marshall P. Wilder. In confirmation of the great benefit of charcoal as a component part of compost manures, he stated to the meeting the result of applying it to seven lots of land in Sandusky, Ohio. The first was a lot of land of twenty acres, to which fifty bushels of charcoal were applied, and no other manure, and the result was 25 bushels of wheat per acre—lot No. 2, 4 acres, no coal applied, result 5 bushels—Nos. 3, 4, and 5 contained 15, 25, and 15 acres, 50 bushels coal per acre applied, result 25 bushels per acre—No. 6, 8 acres, no coal applied, result 5 bushels—No. 7, 6 acres, no coal applied, result 3 bushels per acre. The soil and culture on all the lots were alike. The coal cost $30 per 1000 bushels, and was ground in a bark mill before being applied. It was stated at the last meeting that 80 bushels of wheat had been obtained by the application of 50 bushels of charcoal to the acre. This was considered by a gentleman very extraordinary, if not improbable. Mr. Wilder said he would submit the following statement from Mr. Colman's European Agriculture and other authorities, in confirmation that in England the average yield of wheat was 26 bushels to the acre, while in some portions it greatly exceeds that amount. In Lincolnshire from 50 to 60 bushels is often obtained. In the isle of Jersey 66½ bushels have been produced; in Hampton 70 bushels; in Norfolk a well-attested report was made of 90¾ bushels; and at Feversham 60 to 70 bushels; and in one instance it was ascertained, upon a wager, to be 80 bushels."

The question arises with us, whether, where wood is dear and turf more abundant as in Massachusetts, it might not be economical to carbonize turf for manure or other uses, to which charcoal is applied. This is done in Ireland after the fashion that wood is managed for the same purpose. The sods must be regularly arranged and laid as close as possible. They are the better for being large, fifteen inches long, by six broad and five deep. The heaps, built hemispherically, should be smaller in size than heaps of wood usually are. In general 5000 to 6000 sods may go in a heap, which will thus contain 1500 cubic feet. The mass must be allowed to heat more than is necessary for wood, and the process requires to be very carefully attended to, from the extreme combustibility of the coal. The quantity of charcoal obtained by this mode of carbonization is from 25 to 30 per cent. of the weight of the *dry* turf.

But the turf may be so compressed that its charcoal will obtain a greater density than that from wood. Mr. Walker, the very worthy successor of Col. Wilder (easier to be followed than overtaken) as President of the Horticultural Society, said, among other things worthy of note,

"I prefer clay to charcoal, but at all times I want sand in my compost heap—either sea sand or wash from the gutters. Have found my land much benefited in some cases

by the application of 25 loads of sea-sand to the acre. When land is exhausted, or, in other words, so gorged that it will not produce turnips or radishes, I have ascertained that sea-sand, spread upon the surface, one inch thick, and then raked in, has invariably produced the most desirable effect, and that immediately."

We have long believed that American farmers are not aware, or, if aware, they are certainly neglectful of the advantages of adding clay to sand, and sand to clay land, where, as in many localities especially on our water-courses, they lie contiguous to, and yet separated from each other.

On the coast and creek shores of Ireland millions of tons of sea-sand are used for manure. We are told, on indisputable authority, that much of that which is raised in Cork harbor, after a water-carriage of ten or twelve miles, is taken into the country on one-horse carts, by working farmers, to the distance of ten or twelve miles over hilly roads. In fact, every strand, nook, or bay, to which farmers can get access by a horse or by a cart, is made to supply its quota of sand for manure.

Mr. Teschemacher, who never speaks but to command attention, adverted, in a few sententious and powerful remarks, to the importance of *agricultural education*, and after all, that is the great desideratum, along with *protection to American industry*, such as will compel the loom and the anvil to come to the side of the plough. Do that, and you will ensure prosperity to agriculture; and prosperous agriculture will provide schools, as it has done and is doing in Massachusetts. Agricultural schools are to come next, and we would *begin* by converting all our military establishments, along shore, into agricultural seminaries for rearing instructors in the principles of agricultural field-practice and machinery, and animals, and grain, and grass-growing. In the minds and hearts of our young people are the best localities for fortifications. Said Mr. Teschemacher,

"I have passed the summit of the hill of life, and, thanks to a kind Providence, am quietly gliding down the other side, but if there is one thing I desire to see more than another, while yet here, it is the definite experiment of agricultural schools and experimental farms throughout this vast and flourishing agricultural country. What is the reason why our youth pant after commerce or the learned professions? It is because they require the exercise of the utmost energy of the mind, and this exercise is precisely what youth demands, and the want of this exercise drives them into all kinds of foolish excesses; for this excitement of the mind is invincibly strong. Now, is it not possible to divert these energies of the mind to the successful pursuit of agriculture?—yes, but only by a previous education of the first order.

"Young men often consider a farmer as nothing more than a mere machine—a plough, an ox, a cart, or a hoe, with nothing to do but what his father did before him—and as long as these ideas last, so long will the best of our agricultural population flock to the cities, and many a fine mind be lost."

"*The Plough, Loom, and Anvil* for February has the merits and demerits of its forerunners. There are several valuable practical papers in it, and the others are not valuable, because they are not practical. They are raw theory, of the sort that Cobden in England, and Walker in America, have just read the burial service over."

We unaffectedly prize the well-known good-will of our friend of the Winchester Virginian, but he will excuse us for expressing the apprehension that when he talks about the "*burial service*" read over the doctrine of encouragement to American labor, his position in "the valley" may somewhat limit his view of what is going on among the outside barbarians in the great world beyond. If the funeral service has been read, it has been done with indecent haste on the part of Parsons Cobden and Walker, and without waiting for the subject to be entirely defunct; as our friend of the Virginian would perhaps admit, on a view of the very many letters we get from his own, and from more southern States, exactly in the spirit of the following.—It is by yielding implicitly and too long to such doctrine as that which

is preached by Parsons Cobden and Walker, that Virginia herself, with all her magnificent capabilities, is yet more dead than alive; nor will she ever prosper, as her natural resources entitle her to do, until she draws the manufacturer within her borders, and places him, where Mr. Jefferson recommended he should be placed, by the side of the agriculturist.

Foster's, Tuscaloosa Co., Alabama, Feb. 1, 1849.

MESSRS. J. S. SKINNER AND SON:—GENTS:—"Being about to remove to Mississippi, I wish you would forward the remaining numbers of the 'Plough, the Loom, and the Anvil' to my address, 'Parairie Point, Noxubee county, Miss.' I am so much pleased with your excellent periodical, that I intend to preserve them and have them bound as a book of reference, and not destroy them, as some of our farmers are addicted to doing. Though not a farmer, I take great delight in reading a work which has so much at heart the welfare of the country, and especially that of the farmer.

"I am now convinced that the only way the plough can prosper is in connection with the loom and anvil. And I am pleased to see such a manufacturing spirit among our southern people, which is daily increasing. I think everybody who is able (and especially every farmer) ought to subscribe to your periodical.

"I shall exert myself to increase its circulation. When I commenced I thought I would only say a few words, but the interest I feel in your success has caused me to say more. Your obedient servar... J. C. B."

Some friend has kindly sent us the proceedings of the Agricultural Convention of the State of Delaware, held at Dover on Jan. 17, 1849.

They indicate a most promising public spirit throughout that State.

J. C. Clark of Newcastle County was appointed President of the Convention.

The subjects presented for consideration, by C. P. Holcomb, Esq., chairman of the business committee, had reference to the trade in *lime* and *guano*—to the mode of paying *taxes*—to cattle moving at large in the public highways of Newcastle County—to banks—and to equalizing taxes. Mr. Holcomb, from the same committee, reported a constitution of the Agricultural Society of Delaware, which was adopted.

The society was organized, and the following officers were nominated and confirmed:—

President.—Peter F. Causey.

Vice-Presidents.—John D. Dilworth, Newcastle County; Dr. H. Ridgely, Kent County; T. P. McColley, Sussex County.

Treasurer.—Dr. William Burton.

Corresponding Secretaries.—A. M. Higgins, Newcastle County; W. Duhammel, Kent County; P. N. Rust, Sussex County.

Recording Secretary.—Manlove Hayes, Jr.

Managers.—Daniel Corbit, David W. Gemmill, and J. P. Bellville, of Newcastle County; Jacob M. Hill, John Frazer, and James G. Waples, of Kent County; Jona. R. Torbert, Lemuel Draper, and Charles Wright, of Sussex County.

On motion of Mr. Moore, said report was adopted.

We regret not to find among the proceedings any movement to demand from the general government a diminution of appropriation for warlike purposes and establishments; and a proportional application of the public money for *agricultural education.* But that will come sooner or later as the natural fruit of advanced civilization.

More than seventy farmers joined the society on the spot, and it was decided to hold the first State fair at Newcastle, on Wednesday and Thursday after the first 3d Monday in October next.

THE BEE.

"So work the honey-bees;
Creatures that, by a rule of nature, teach
The art of order to a peopled kingdom."
SHAKSPEARE'S *Henry IV.*

I HAVE some experiment-hives which enable me very accurately to inspect the operations of my bees. From the construction of the hives, the combs are necessarily built between two panes of glass, so that on drawing the sliders the two surfaces of a comb are exposed to view. In this way I am able to see almost every thing that is going forward.

When the queen-bee has an inclination to deposit her eggs, she goes forth, accompanied by six or eight working bees as a guard, whose stomachs are filled with honey. She is very deliberate in her motions, and seems to proceed with great caution. She first looks into a cell, and if she finds it perfectly empty, she draws up her long body, inserts her tail into the cell, and deposits an egg. In this way she slowly proceeds till she has dropped ten or twelve eggs, when perhaps feeling exhausted, she is fed by one of the attendant bees, who have surrounded her the whole time. This is done by the bee ejecting the honey from its stomach into the mouth of the queen. When this has been done, the bee goes away, and another takes its place. The operation of laying her eggs again goes on, and is succeeded by the same mode of feeding—the attendant bees frequently touching the antennæ of the queen with their own. When the operation of laying the eggs is completed—and it generally occupies some time—the queen retires to that part of the hive which is most filled with bees. During her progress, the surface of the comb is very little intruded upon, and the space seems purposely to be left unoccupied. Some few of the cells, however, in a brood comb, are passed over by the queen, and afterwards filled either with honey or farina. These serve as deposits of food, from which the neighboring brood may be fed more readily, as such cells are never covered with wax.

With the hives referred to I have been able to follow many of Huber's experiments, and can bear witness to his general accuracy, except in regard to the fecundation of the queen-bee. I have bestowed much time and pains in endeavoring to discover any of the circumstances he mentions relating to this fact, but without success. Neither have I ever seen a cell visited by one of the drones *after* the egg had been deposited, which a modern writer has asserted they do. I have for many years watched my hives with the greatest care and assiduity, but have never yet seen the queen-bee leave the hive, except at the time of swarming. I have also spoken to several experienced bee-masters on the subject, and they are of the same opinion with myself—that she never quits it. Her person is so easily distinguished from the other bees, by any one at all conversant with them, that if the queen absented herself from the hive, in the way Huber describes her as doing, it seems next to impossible that she should not have been perceived, either on her departure from, or on her return to, the hive. And yet we have no English writer on bees (and we have many acute and observant ones) who has even hinted at the probability of the queen's leaving the hive in the manner Huber asserts that she does. It is now many years since his work was published, and no part of it is more curious or more satisfactory, if correct, than what he says on the impregnation of the queen-bee. Curiosity has in consequence been much excited, and many persons, like myself, have been anxious to ascertain the accuracy of his statements. It does not appear, however, that any one in this country has succeeded in doing this, though we have many very patient observers. Is it probable, therefore, that it should have been reserved for Huber alone to ascertain a fact which had escaped the notice of naturalists, not only for ages before, but, what is more singular still, for years since the publication of it in his work? It should be recollected also that Huber was blind, or nearly so, and that he was obliged to rely very much on the reports made to him by his assistant, Burnens. It is however with considerable diffidence that I would venture to doubt the accuracy of any statement of his, especially when the objection turns, not upon a contradictory circumstance, but upon what myself and others *have not been able to discover.*

Wax is a secretion formed under the scales of the back of the insect, from which I have repeatedly seen it exfoliate in small flakes. A considerable degree of heat appears to be necessary to produce this secretion, as I have always observed it most abundant in hot weather. Other writers have maintained that the wax is discharged from the abdominal rings, or segments of the bees. This may be also the case, but I have never perceived it.

The vision of bees seems very imperfect. I have frequently turned a hive, so as to make the entrance about two or three inches from its former position, and have then always found the bees at a loss to gain admit-

tance. Indeed they seem more to *feel* their way than to see it, after they have once landed themselves on the board of their hives. Their progress through the air is always made in a direct line to the hive, and the instinct which enables them to find it, amongst forty or fifty others placed in a row, and nearly similar to each other, is very striking.

Wasps appear to have a better vision than bees, though it is not easy to assign a reason for this being the case, since the construction of the eyes of both insects seems to be similar. Derham, in his Physico-theology, has observed in regard to the eye of the bee and wasp, "that the cornea and optic nerves being always at one and the same distance, are fitted only to see distant objects, and not such as are very nigh; and that the eye will be found on examination to form a curious lattice-work of several thousand hexagonal lenses, each having a separate optic nerve ministering to it, and, therefore, to be considered as a distinct eye." Wasps, however, certainly seem to alight at the entrance of their nests with more accuracy than bees. I have frequently observed this to be the case, even when the hole of a wasp's nest has been in a field, and surrounded with long grass. They alight at it with the greatest precision, seldom or never going even half an inch either on one side or the other of it, and they do this even late in the evening.

Bees which have been once exasperated, do not soon forget the injury. This was the case with one of my hives, the bees of which never allowed me for two years to come near them while they were working, without attacking me, though a neighboring hive would allow me to take almost any liberties with it with impunity. Indeed I had familiarized myself so much with some of my bees, that I am convinced they knew me, and they always appeared to distinguish me from strangers. By constantly standing before the mouth of the hive, and allowing vast numbers to fly about and settle upon me, and by frequently feeding them, they became so well acquainted with me, that I had much pleasure in witnessing their attachment, and the confidence they placed in me. This affection was mutual, and I always think with pleasure of the many agreeable hours I have passed in company with my insect friends. Those only can judge of this, who, like myself, have witnessed their assiduity, their internal labors, their affection for their queen, and all the various modes they take in promoting the prosperity of the community. I always listen to the pleasing hum of bees with delight, and know of few sounds more soothing and agreeable.

In some papers published a few years ago in the "Plain Englishman," I endeavored to point out the great cruelty of procuring honey by the suffocation of bees, and the advantage which the bee-owner would derive from contenting himself with a part only of their stores. This may be done by placing a small hive-glass, or even a flower-pot, on the top of each hive in April or May. These should be of a size to hold about eight or ten pounds weight of honey; and in a tolerably good season they will generally be filled, leaving a sufficient stock of honey for the bees to subsist upon till the following spring. I am happy to find that this method is more generally practised than it formerly was. By adopting it, the lives of thousands of these industrious insects would be saved; the profits of the bee-owner would be much more considerable, and his stock of bees annually increased.

The summer of the year 1818 was unusually dry and hot, and in July flowers of almost every description had entirely disappeared. I observed that bees, in consequence of this, seldom left their hives in search of honey, though the weather, one would have thought, would have tempted them out. They seemed, indeed, to be perfectly aware that their labor would be useless. I recollect meeting with an account of a hive of bees being transported from a distant place, to a spot by the side of a mountain in Italy, where they they could procure honey all the year round. Finding this to be the case, they soon gave up stocking their hive, and only went out to collect honey as they wanted it. The same observation has been made on bees taken out from this country to the West Indies. The first year they stored their hive as usual, but ever afterwards they merely supplied themselves with food from day to day.

The lower orders of people in this and some other places have curious superstitions respecting this insect. A poor old widow once complained to me that all her stocks of bees had died, and on inquiring the cause, she informed me that on the death of her husband, a short time before, she had neglected to *tap* at each of the hives to inform the bees of the circumstance; that in consequence of this omission they had been gradually getting weaker and weaker, and that now she had not one left. This may be supposed to have been a solitary instance of superstition, but such is by no means the case, and I believe it will be found that very generally on the death of a cottager who has kept bees, some ceremonious observance

takes place. Mr. Loudon mentions that when he was in Bedfordshire, he was informed of an old man who sang a psalm in front of some hives which were not doing well, but which he said would thrive in consequence of that ceremony. This may be a local or individual superstition, but the announcement to the bees of the death of the owner is certainly a more general one. A correspondent of Mr. Loudon's mentions, that in Norfolk, at places where bees are kept, it is an indispensable ceremony in case of the death of any of the family to put the bees in mourning, or the consequence would be that all of them would die. The person who made the assertion mentioned a case in point, where, from the neglect of the custom, every bee in the apiary had perished. The method of putting them in mourning is by attaching a piece of black cloth to each of the hives. Another correspondent also says, that in the neighborhood of Coventry, in the event of the death of any of the family, it is considered necessary to inform the bees of the circumstance, otherwise they will dwindle and die. The manner of communicating the intelligence to the little community is, with due form and ceremony to take the key of the house, and knock with it three times against the hive, informing the inmates, at the same time, that their master or mistress, as the case may be, is dead. A similar custom prevails in Kent, and in some places it is considered expedient to communicate any great event that may take place to these industrious insects. The use of a key seems necessary in another ceremony which takes place in regard to bees. When a swarm has quitted one of my hives, I always observe that a key is used to induce it to settle, by striking it against a frying-pan, and I should feel some regret if this good old custom was omitted. So far from letting the *ringer* think that the tinkling noise he makes is a useless one, I always encourage the practice of it, and it is one of the many pleasurable sounds of the country. Often have I quitted my room on hearing it, to enjoy the sight of my additional wealth, and to assist in securing it. The day is sure to be warm and *smiling*, and I watch the increased accumulation of my clustering bees with infinite satisfaction. The old customs I have mentioned, and many similar ones which are practised by my poorer neighbors, may be laughed at; but I like them all as long as they are innocent, and I consider them as adding in some degree to the interest of a country life.

To a thinking mind, few phenomena are more striking than the clustering of bees on some bough, where they remain, in order, as it were, to be ready for hiving:—

"arbore summâ
Confluere, et lentis uvam demittere ramis."—VIRGIL.

"They make a wheeling flight,
Then on a neighboring tree, descending, light:
Like a large cluster of black grapes they show,
And make a large dependence from the bough."
DRYDEN.

I observe that where a hive is fixed over a swarm, the bees will generally go into it of their own accord, uttering at the same time their satisfied hum, and seeming to be aware of the purpose for which it was placed near them. How the queen-bee is made acquainted that so convenient a place for her to retreat to is near at hand, I know not, but so it is. Surrounded by thousands of her subjects who press around her, she makes her way through them all, and enters the hive, followed by the whole swarm. Some means of communication must have taken place, as it is quite impossible that she could herself have seen the snug retreat which had been prepared for her. Here the work of preparing future cells is instantly commenced, and I have found that although a swarm has not been able for two or three days to quit the hive after they had taken possession of it, a considerable number of cells had been nearly completed. Even as soon as the foundation of a cell has been finished, the queen-bee will sometimes deposit an egg upon it, the sides being afterwards built up. As the cells increase in number, honey and the farina of flowers are stored in them:

"The careful insect 'midst his work I view,
Now from the flowers exhausts the fragrant dew;
With golden treasures loads his little thighs,
And steers his distant journey through the skies:
Some against hostile drones the hive defend,
Others with sweets the waxen cells distend
Each in the toil his destined office bears,
And in the little bulk a mighty soul appears."
GAY.

Nothing can be more melancholy than the appearance of bees in wet weather. Some of them I have observed to come to the mouth of the hive, as if to take a view of the passing clouds, and some of those who are tempted to quit the hive return to it with the greatest difficulty. A sunshiny day in May is their delight, and it is then that bees seem most active and most joyous.

Magnitude of the Sun.—The sun is more than 500 times greater than all the planets, satellites, and comets of our system; it is equal to 1,300,000 globes as large as the earth; and its surface contains an amplitude 53,770,000 times larger than the view from Mount Etna, which comprises an extent of 45,000 miles.—*Dick.*

MANUAL OF MANNERS.

VISITING.

On this subject much need not be said, the usages of the world as to visiting being simple and well known.

Visits of mere form are no longer expected among equals in society; there being something of restraint in whatever belongs to ceremony, which is at all times a cold and constraining thing, and to be avoided, especially among friends and intimates.

Visits ought to be well-timed, otherwise they will be unwelcome to the one party, and irksome to the other.

Idle people do not reflect that "time and the hour" are as much to be observed by the visitor as by the farmer or the mariner. Full of leisure themselves, they seem to care little how they inconvenience others, by the inopportune period of their calls, or the length of their stay. They spend their own time and that of other people to no purpose; and their conversation is not such as to offer any equivalent for the loss. To such persons it will be necessary only to say at once that you are busy. They do not stand upon ceremony with you, why should you be particular with them? At the same time, such a reason for not seeing even one whom you consider a friend, when he calls, cannot be stated with any degree of propriety unless you are really busy. Politeness does not compel you to sacrifice your time to idle chat, or common-place remark, because a friend visits you; nor does it require you to conceal the truth from him. If it is a person whom you may see at any time, to show any reserve on this point would be treating him as a stranger.

How much soever engaged you may be, should a visitor call, it is always better, either at once to inform him that you are occupied, or, which will be esteemed more polite, to quit your occupation for a moment, and tell him so yourself, with an apology for not asking him to remain, to instructing your servant to say that you "are not at home;" a declaration which, besides being untrue, and therefore contrary to the real spirit of politeness, has now become so common an excuse, that in most instances it is not believed.

When a visitor is told that the person whom he calls to see is particularly engaged, to press upon his time, or insist upon seeing him, unless upon the most urgent business, is the extreme of rudeness.

It may happen that you do not wish to see your visitor; in which case, the best method is to send with the servant a polite message, that you are not in a condition to receive visitors. Of course, where you desire to drop the acquaintance of any one, all that is necessary is, not to return his call. Where a card is left, a visit is expected in return, or at least the call to be acknowledged by leaving your own card within a few days.

This one thing you must ever keep in view, that, in visiting, as in every other department of conduct, affability never loses any thing, but rather gains in the estimation of all with whom you may come in contact. In your intercourse with society, you will find courtesy to be the surest passport to the good opinion of others.

In visiting it is essential that you never forget your own character and position in society. Nothing is more necessary than that you should be particularly guarded as to the reputation of those on whom you call, or allow to call upon you. To interchange visits with one regarding whose exact position or reputation you are not precisely certain, would be an indiscretion of which you might soon have reason to repent. An interchange of visits is equivalent to the acknowledgment of a mutual acquaintance, and involves the recognition of a desire that that acquaintance should continue. There are those who, on the faith of a simple introduction, will intrude on you at home, and be as familiar as though they had known you for years. With such people it is easy to deal. They play, as it were, fast and loose in society; and, with good luck generally, they must expect sometimes to meet with rubbers. If they are received with coldness where they are led to expect a different reception, it does not embarrass them in the least; they are prepared for either alternative, like the professional gamester, who stakes his all on the chance of securing a prize to which he has no claim, or losing a sum on which he sets no value, but as a means of gambling. You must conduct yourself at once towards such intruders with indifference, though, for your own sake, with politeness, if you are not sure of their position, or desirous of their acquaintance. Should they invite you in return to their houses, the most discreet thing you can do, until you know them better, is not to accept of their invitation, however pressing it may be. You are not, however, to consider that all you meet with in society, who show a desire to cultivate your acquaintance, are persons of this sort; but the probability is, that whosoever acts in this manner, does it with an object different from what is understood in the legitimate usages of society. It is always the best policy to treat strangers with reserve, and never to be on too intimate a footing with any one.

The etiquette of visiting is a wide subject for remark. The object of this book, as already explained, and as may be gathered from the observations in previous pages, is higher than the description of mere rules of etiquette. It is therefore unnecessary for me to enter upon these as regards this branch of the subject. Every one at all in the habit of visiting, must be aware of many observances which it does not fall within the scope of this work to notice.

But it may be given as a general rule: Not in your neighbor's house to exhibit ill-breeding, by affectation or undue familiarity; nor by pride or assumption display rudeness or self-sufficiency in your own.

One remark may be made, in conclusion, as to visiting on a Sunday. This ought to be a practice confined exclusively to relatives. But should you have a desire to wait upon any one, uninvited, you are bound to consult his feelings and rule of conduct. There are many persons who, from the most praiseworthy motives, dislike being visited on that day by strangers. Should any visitor, in calling on a friend on such a day, be disappointed in seeing him, he ought not to attribute his disappointment to his friend's being unsuitably engaged, or to any reluctance on his part to bid him welcome. It will be more in the spirit of true politeness, as well as more in accordance with what one would expect in his own case, to put the best construction on the matter, and to presume that the latter, from conscientious motives, is unwilling to encourage mere calls of convenience or ceremony on that particular day. In this, as in every thing else, keep in mind always the golden rule, "To do unto others as you would wish others to do unto you."

THE WHOLE DUTY OF WOMAN.

EMPLOYMENT.

From whom cometh evil? from whom poverty and dejection of spirit?

Idleness is the mother of mischief; idleness is the parent of shame and disease.

The slothful spendeth the day in slumber: she waketh at noon, she drinketh her cordial, and inquireth the time of the morning.

She turneth again to sleep, and awaketh not till the dinner of the evening.

She converteth the night into day, and keepeth the light of the sun hid from her eyes.

Her house is a scene of riot and confusion; she hath eye-servants.

Her appetite faileth, and the physician is daily set down at her door.

Industry is up with the sun; she awaketh at the crowing of the cock, and walketh abroad to taste the sweetness of the morning.

She is ruddy as the daughter of health; her ears are delighted with the music of the shrill lark.

Her garment sweepeth the dew-drop from the new stubble and the green grass, and her path is by the murmuring of the purling brook.

Her appetite is keen; her blood is pure and temperate, and her pulse beateth even.

Her house is elegant; her handmaids are the daughters of neatness, and plenty smileth at her table.

She saunters not; neither stretcheth herself out on the couch of indolence.

She crieth not, what have I to do? but the work of her hands is the thought of a moment.

She listeneth not to the gossip's tale; she sippeth not her tea in scandal; but employment is the matter of her discourse.

Her work is done at the evening; but the work of the slothful is put off till to-morrow.

VIRGINITY.

The coronet of glory decketh the head of the young vestal; she sitteth in respect; her steps are attended with reverence, and the words of her mouth are held in high estimation.

She approacheth the excellence of angels; her state is that of the most perfect innocence of mortality.

The heathen consecrated her to divinity; her trust was esteemed an inviolable security, and her intercession gave life to those who had forfeited it unto death.

The Christian calleth the mother of salvation by her name; she is honored throughout the whole earth.

Art thou enamored with the beauty of her condition; wouldst thou honor thyself in her situation, attend to the voice of instruction, and shun the rock on which the vessel of thy sister hath been dashed to pieces.

Presume not on a vow of chastity, nor be transported with the zeal of voluntary virginity; there is no merit in constraint—there is no virtue in forced obedience.

Be cautious, lest thou sully the whiteness of innocence; the least speck is seen on the new-fallen snow.

Let not curiosity mislead thee; for curiosity is unseemly in a woman, but in a virgin dangerous as the breath of evil.

Let thy conversation be with the sisters of elegance; listen not to the levity of the daughters of indiscretion.

Do they say there is no harm, we may talk, for the words of our lips are air, and not criminal: these are the snares of the licentious; the breath of their mouth is malignant, the sparkling of their eyes is contagious.

They will infect thee to do ill, thou wilt fall into the snare before thou art aware thereof.

As the ladder descendeth by degrees, so many are the intermediate steps between the modesty of the virgin and the boldness of a prostitute.

Let not thine ear listen to the tale of the wanton, nor be privy to the amour of thy sister, even with her sworn spouse.

Delight not in the romantic tales of love: the triumphant beauty and the captive knight are deluding images to thy passions.

A fictitious tale may awaken a real curiosity, and that may prove fatal to thy peace.

Learn not wisdom of thy companions, nor endeavor to overreach the sagacity of thy mother.

Let thy toilette claim thy morning hours; but dress not a second time in a day.

Thy elegance will be an ornament; but thy frequent change of apparel will savor of profuseness and uncertainty of temper.

Let not thy servants fly thick with invitations; neither be thou much affected if the rout be put off till to-morrow.

Be not perpetually gadding abroad; neither let the gadder abroad be often invited to thine own home.

In thy father's house, learn the economy of a wife from thy mother; so shalt thou carry it into life, and be the comfort of thy future husband.

Is there who delighteth in assemblies; who prideth herself in the pleasures of the mask; who staketh her fortune on a dye, she putteth her honor in the hands of a sharper, and placeth the jewel of her reputation on the next hazard.

The days of her virginity shall want the honor thereof; and the man who giveth his freedom for her embraces, shall repent of his bargain.

Gray hairs are uncomely to the virgin, the ancient maiden is a by-word with her sisters, and is accounted ill-conditioned among women.

Doth she strive to hide her years, doth she assume the gayety of her youth; her celibacy will not appear the effect of choice, but of necessity.

Reject not the ordinance of marriage, nor put the day afar off, when it promises thee happiness.

Yet, trust not a man on thine own knowledge; confide not in his appearance before thee.

Deceit is familiar to his ways, and flattery and hypocrisy the fruits of his tongue.

Is he obsequious, ceremonious, and full of words; though the honey of the wild bee is on his lips, yet the sting of the hornet lieth hid in his bosom.

Be not taken with the appearance of gayety: the painted butterfly is an emblem of the coxcomb.

Be not deceived by the high opinion of heroism, by the empty braggart; he is as the sound of a drum, and the security he promiseth thee but the defence of a coward.

Neither is the valor of a man, or the strength of his arm, an indication of the integrity of his heart.

Hath he slain his friend in defence of thy beauty, is his sword loose in its scabbard; join not thy hand with his, lest thou repent the magnanimity of thy husband.

Take not a man absorbed in study, the philosopher is not a man of this world; he will be absent even in thy company, he will be as a child to be taught the common forms of ceremony.

He will hold thee inferior to his profound wisdom, he will regard thy remonstrances as the conceptions of a weak woman.

Thou wilt have no companion in him; he will be wanting in the duties of his family.

Listen not to the servile, who cringeth low and is a beggar in his solicitations; for when he hath command, he will be imperious; thou wilt perceive he knoweth not himself.

Avoid the libertine as the fiery serpent; he is the destroyer among the daughters of women.

Thou wilt be wedded to him, yet have no husband; thy bed will be barren, and thy nights comfortless and forsaken.

Doth he promise reformation, yet thou hast no security.

Dost thou flatter thyself thy charms will engage him for ever, thou wilt find thyself deceived ere the waning of the moon be over.

Give not thy youth to the embraces of age, nor the treasure of thy beauty to enrich the poverty of the decrepit.

The gravity of age ill suiteth the levity of youth, and disparity of years is the source of many inquietudes.

Sell not thyself for gold; for contentment is not the portion of riches.

Let the voice of a parent sanctify thy choice, but let thy director thereto be thine own happiness.